

Table 3.6-6 Federal and State Species of Concern That May Occur in the Project Area		
Common Name	Species Name	Status Federal ^a /State ^b
Amphibians		
Foothill Yellow-legged Frog	<i>Rana boylei</i>	SC/CSC
Reptiles		
California Horned Lizard	<i>Phrynosoma coronatum frontale</i>	SC/CSC
Mammals		
Spotted Bat	<i>Euderma maculatum</i>	SC/CSC
Greater Western Mastiff-bat	<i>Eumops perotis californicus</i>	SC/--
^a Federal status: SC = Species of Concern ^b State status: CSC = California Species of Concern -- = No listing		

Measures for Entrapped, Injured or Dead Special-Status Animal Species

Commitment: All reasonable efforts will be made to allow any entrapped animals to escape. Any dead or injured animals will be turned over to CDFG or USFWS.

Responsible Parties: Reclamation/Construction Contractor - On-site Monitor

Location: Entire Project area, including staging sites and access routes

Timing: During all phases of construction (2002 through 2004), as needed

Monitoring: No specific monitoring requirement

Reporting Requirements:

A written report detailing the date, time, location, and general description of the circumstances under which an animal was found must be submitted to CDFG and/or USFWS no later than three business days following the incident.

Description of Activities:

Reclamation will require the Construction Contractor to ensure that all injured or killed special-status species are reported to CDFG or USFWS and handled appropriately.

Success Criteria:

All incidents are reported to CDFG or USFWS and handled appropriately. Include documentation in construction compliance reports.

Restoration of Permanent Riparian, Wetland and Pond Vegetation/Habitat Loss

Commitment: Restoration of river channel through Project area will provide enhancement of wetland and riparian habitat such that all construction-related permanent vegetation loss is fully mitigated.

Responsible Party: Reclamation

Location: Project area/river channel

Timing:	Post-construction
Monitoring:	Monitor re-establishment of wetland, pond, and riparian vegetation associated with the restored river channel
Reporting Requirements:	Provide Summary Reports, including photographs of the Project site, with benchmarks prior to construction, and at years 1, 3, 5, and 10 following river restoration

Description of Activities:

Restoration of the North Fork American River channel, including creation of a “naturally functioning” river system will provide overall vegetation and associated habitat enhancement at the Project site. Reclamation will monitor the long-term natural re-establishment of vegetation and habitat areas and report to resources and permitting agencies. In consultation with these agencies, Reclamation may implement an adaptive vegetation restoration strategy, if needed, to supplement natural re-growth at the site.

Success Criteria: Document natural re-establishment of vegetation in Project area.

Other Related Mitigation Measures

Fish Resources and Aquatic Habitat, Mitigation Measure 3.1-2, avoids changes to the flow and water source composition of Auburn Ravine, thereby avoiding any Project-related change to terrestrial (riparian) resources along the Auburn Ravine corridor.

Noise, Mitigation Measure 3.9-2, results in lower operational noise levels in the Project area than under existing conditions, reducing operational noise impacts to wildlife.

Public Health and Worker Safety Mitigation Measure 3.10-5, design of the public river access features includes installation of posts and other barriers to prevent off-road travel, thereby minimizing the impacts of increased vehicular access at the Project site upon individual wildlife species and habitat.

3.7 WATER QUALITY

3.7.1 AFFECTED ENVIRONMENT

3.7.1.1 Regional Setting

The regional setting includes water bodies whose water quality may be indirectly affected by the Proposed Project or alternatives. Because the Proposed Project and other reasonably foreseeable actions within the American River Basin would result in changes to CVP system operations, and potentially influence SWP operations, certain CVP and SWP system components and associated waterways are included in the regional study area. These facilities include: Trinity and Shasta reservoirs, the upper and lower Sacramento River, Folsom Reservoir, Lake Natoma, the lower American River, Delta, Oroville Reservoir, and the Feather River. Detailed descriptions of the beneficial uses and water quality of these resources are included in the Cumulative Report (Appendix D of the Draft EIS/EIR).

3.7.1.2 Project Area Setting

The project area represents the direct effect study area for water quality and includes the Middle Fork American River from below Ralston Afterbay to the confluence with the North Fork American River and downstream to Oregon Bar (Figure 2-2).

The beneficial uses of the Middle and North Forks of the American River include:

- ☐ Municipal and domestic supply
- ☐ Agricultural supply
- ☐ Water contact and non-contact recreation
- ☐ Potential warm freshwater habitat
- ☐ Cold freshwater habitat
- ☐ Cold freshwater spawning, reproduction, and/or early development of fish
- ☐ Wildlife habitat

Water quality in the American River is considered to be good, although historical water quality data for the North Fork and Middle Fork are sparse (Corps 1991). During construction activities for Auburn Dam, Reclamation collected water samples at two sites upstream of the Auburn Dam construction site and two sites downstream. These samples were analyzed for pH and turbidity. Although construction of Auburn Dam was halted in 1977, monitoring was conducted weekly until 1995. Data for 1991 and 1992 were evaluated. Because data for other years shows little variation, the 1991-1992 water year is considered to be representative of the entire period (P. Vonich, pers. comm. 1998). Turbidity was low at the nearest downstream and upstream monitoring sites, with annual averages just below or above one Nephelometric Turbidity Unit (NTU). The pH ranged from 7.0 to 8.2 at the four monitoring sites. Information on sediment in the river was not readily available; however, turbidity results indicate the river carries little sediment during low flows.

Several wastewater sources discharge into the North and Middle Forks of the American River, or to their tributaries. Sources of wastewater discharge include two sawmills located at Foresthill; one is on a tributary to Devil's Canyon and the North Fork American River, the other discharges directly into the Middle Fork American River.

3.7.2 ENVIRONMENTAL CONSEQUENCES/IMPACT ANALYSIS

3.7.2.1 Methodology

Facilities-Related Analysis Approach

The anticipated construction, operation, and maintenance impacts on water quality were assessed in part by consulting with project engineers on the project design team and Reclamation staff. Specifically examined were the diversion and intake structure configurations, changes in sedimentation at the diversion structure, and channel stability as it relates to water quality.

The impact assessment focuses primarily upon recreation and drinking water uses because these water quality standards are more stringent than water quality standards for other beneficial uses and purposes. The effects of the project on water quality for fisheries resources, primarily water temperature-related, are discussed in Section 3.5, Fish Resources and Aquatic Habitat. Wildlife uses generally receive lower water quality standards than fish; groundwater recharge, and industrial and agricultural supply require lesser standards than drinking water supply; and navigation and power generation are not dependent on water quality.

Diversion-Related Analysis Approach

The assessment of water quality impacts within the regional study area water bodies focuses on the potential for the alternatives to result in increased water quality constituent concentrations through the reduced contribution of flows with low constituent concentrations. The focus of the analysis is on the quality of water available to downstream users for drinking water supply and for recreational uses of the river downstream of the project site. Reclamation's PROSIM model was used to simulate hydrologic conditions over a 70-year period of record (1922 through 1992) for Folsom Reservoir, the lower American River, and the Sacramento River, including the Delta.

The evaluation of water quality impacts is based on a comparison of CVP reservoir surface water storage volumes and American and Sacramento river flows under existing and future conditions with and without the project. Because the timing and amount of the proposed diversion increases under the Proposed Project and Upstream Diversion Alternative are identical, the analysis of impacts is combined into one discussion and referred to as "Action Alternatives."

The model simulations and comparisons were described in Section 3.3.2. Additional details of the hydrologic modeling process are included in Appendix E of the Draft EIS/EIR.

3.7.2.2 Applicable Laws, Ordinances, Regulations, and Standards

Applicable laws, ordinances, regulations, and standards were reviewed to identify permitting and other regulatory compliance requirements for the alternatives. The Corps, RWQCB, CDFG, CDPR, and the counties of Placer and El Dorado have water quality policies and/or standards applicable to the study area. Water quality-related objectives, policies, and permit requirements are discussed below.

Regional Water Quality Control Board - Water Quality Control Plan

In the WQCP for the Central Valley Region (the Basin Plan), the RWQCB (1994) establishes beneficial uses for water bodies in the Sacramento River basin. Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning. The RWQCB establishes water quality objectives to protect these beneficial uses from waste discharges. Water quality objectives are defined as the limits or levels to which constituents (e.g., copper) or characteristics (e.g., temperature) can be changed without unreasonably affecting beneficial uses.

Based on the beneficial uses identified for regional and project area water bodies listed in Section 3.7.1 and Appendix D, Chapter 3.0, of the Draft EIS/EIR, and a review of the waste discharges that could result from the alternatives, a summary of the water quality constituents potentially altered were identified and are listed in **Table 3.7-1**. The RWQCB objectives for these constituents for the affected water bodies also are described.

Table 3.7-1 Water Quality Objectives for the Affected Water Bodies		
Constituent	Beneficial Use	Objective
Sediment	All uses	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Turbidity	All uses	<p>Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Where natural turbidity is between 0 and 5 NTU, increases shall not exceed 1 NTU. <input type="checkbox"/> Where natural turbidity is between 5 and 50 NTU, increases shall not exceed 20 percent. <input type="checkbox"/> Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 percent. <input type="checkbox"/> Where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent.
Source: RWQCB 1994		

The RWQCB Basin Plan allows conditional waivers of waste discharge requirements for construction activities under the limitation that BMPs are implemented. The assumption is that if these BMPs are implemented properly, the Basin Plan water quality objectives will be met. For longer-term construction projects (e.g., requiring more than a few days), daily monitoring is

required to confirm that water quality objectives are being met. A mixing zone of approximately 100 to 300 feet may be allowed, depending on site conditions (K. Landau, pers. comm. 1998).

BMPs for construction activities are designed to minimize erosion and control sedimentation. The objectives of these BMPs generally are to:

- ❑ Minimize soil disturbance/vegetation removal;
- ❑ Stabilize and revegetate soils after disturbance and before the rainy season;
- ❑ Trap loosened sediments; and
- ❑ Design an adequate stormwater runoff control system (Basin Plan).

Maintenance activities, as with construction activities, also are required to meet the Basin Plan's water quality objectives. Generally, short-term maintenance activities are assumed to not result in violations of water quality objectives. For longer-term maintenance activities (e.g., a week-long activity occurring more than once a month), daily monitoring is required to confirm that water quality objectives are being met. A mixing zone of approximately 100 to 300 feet would be allowed, depending on site conditions (K. Landau, pers. comm. 1998).

El Dorado County General Plan

The El Dorado County General Plan (1995) has several goals, objectives, and policies applicable to water quality, including:

- Goal 7.3* Conserve, enhance, and manage water resources and protect their quality from degradation.
- Objective 7.3.2* Maintenance of and, where possible, improvement of the quality of underground and surface water.
- Policy 7.3.2.1* Stream and lake embankments shall be protected from erosion, and streams and lakes shall be protected from excessive turbidity.

Placer County General Plan

The Placer County General Plan (1994) has two policies that address water quality:

- Policy 6.A.4(e)* Where creek protection is required or proposed, the County should require public and private development to:

Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: (1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas are stabilized with permanent vegetation that will prevent the transport

of sediment off-site; and (2) temporary vegetation sufficient to stabilize disturbed areas.

Policy 6.A.7 The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

3.7.2.3 Impact Indicators and Significance Criteria

Table 3.7-2 lists the impact indicators and significance criteria used in the water quality analysis.

Table 3.7-2 Water Quality Impact Indicators and Significance Criteria	
Impact Indicators	Significance Criteria
<input type="checkbox"/> Turbidity of the North Fork American River.	<input type="checkbox"/> An increase in the natural turbidity of the North Fork American River of 1 NTU or greater (applying an appropriate mixing zone). ^a
<input type="checkbox"/> Potential for increased concentration of contaminants in affected water bodies indicated by decreases in: <ul style="list-style-type: none"> ▪ end-of-month reservoir storage for Folsom, Shasta, Trinity; or Oroville; and ▪ monthly mean flow for lower American River, upper and lower Sacramento River and Feather River below Oroville Reservoir. 	<input type="checkbox"/> A substantial increase in the concentration of contaminants in affected water bodies, based on: <ul style="list-style-type: none"> ▪ A substantial change in end-of-month reservoir storage, relative to the basis of comparison, for any month of the year over the 70-year simulation for Folsom, Shasta, Trinity, and Oroville reservoirs, or ▪ Change in monthly mean flow (cfs) of substantial magnitude or frequency, for any month of the year over the 70-year simulation, for the lower American River (Nimbus Dam and Watt Avenue), upper Sacramento River (Keswick), and lower Sacramento River (Freeport) and Feather River.
Monthly mean location of X2 and Delta export/inflow ratios for all months of the year.	<ul style="list-style-type: none"> ▪ Change in position of X2 and Delta export/inflow ratio, relative to the basis of comparison, of sufficient magnitude and frequency to adversely affect water quality and downstream transport flows over the 70-year period of record.
^a The natural turbidity in the North Fork American River is between 1 and 5 NTU. An increase of 1 NTU was chosen in accordance with RWQCB objectives for turbidity levels in this range (see Table 3.7-1). Note: further consideration of this requirement is anticipated as part of the regulatory permitting process to be undertaken prior to construction of the selected alternative.	

3.7.2.4 Impact Analysis

This section presents the analysis of potential facilities- and diversion-related water quality impacts. A summary of the impact issues, level of significance, and environmental protection and mitigation measures is provided in the Executive Summary to the Final EIS/EIR, Table S-5.

Facilities-Related Impacts

No Action/No Project Alternative

Impact 3.7-1: Construction activities could increase sediment and turbidity in the river, which would affect the quality of water available for downstream beneficial uses.

Under the No Action/No Project Alternative, installation of the seasonal pumps would occur earlier in the diversion season, and removal would occur later in the fall/early winter, making it more vulnerable to damage from high river flows. Installation and removal activities would involve the same practices as currently implemented during seasonal pump station construction, including compliance with regulatory permit terms and conditions to protect water quality. Additional protection measures, including monitoring, may be required in the event of high flows and/or flooding could require occasional rebuilding of the sump pond and reinstallation of project facilities. These measures would be developed through consultation with the Corps, RWQCB, and CDFG, as appropriate. Therefore, compared to the existing condition, turbidity would not be expected to increase by more than 1 NTU. Therefore, the impact would be less than significant.

Proposed Project

Impact 3.7-2: Construction of the pump station and river access facilities could increase sediment and turbidity in the river, which could affect the quality of water available for downstream beneficial uses.

Construction activities for the Proposed Project would involve considerable excavation and spoil movement (up to one million cubic yards), however, much of this excavation would occur in the dewatered channel or other disturbed areas at the site. Closure of the bypass tunnel would require some in-river activity. The movement of such a large amount of material related to channel excavation has the potential to result in increased sediment loading and elevated turbidity levels in the American River and downstream of the project site due to the potential for loose materials to be deposited in the river channel. This potential impact would be minimized to levels considered less-than-significant through standard BMPs discussed later in this section.

Road widening would result in vegetation removal and associated soil disturbance that could result along the embankment adjacent to the road, which potentially would increase turbidity in the receiving waters. Collectively, the construction-related ground-disturbing impacts are not anticipated to result in a substantial amount of soil disturbance. Development of the turnaround and three parking spaces across from the bypass tunnel outlet would occur as part of the channel restoration activities, and would occur prior to re-watering the riverbed. Due to the distance

from the river there would be no direct contribution of soil or rock materials to the river. All materials to be removed from the channel would be deposited in designated excavation material disposal locations and stabilized prior to re-watering of the river channel. The parking area proposed for the former Auburn Dam concrete batch plant also is a sufficient distance from the river that no direct contribution of construction materials to the water would be anticipated. Implementation of construction BMPs for erosion control and grading activities would minimize the potential for direct release of materials to the river during road widening and trail improvements that would take place between the upper flat parking area and Oregon Bar at the river. Few improvements would be made from the point of the proposed vehicle turnaround area near Oregon Bar and the river itself. These improvements generally would include development of improved drainage courses for surface water runoff and would be performed manually to minimize the extent of vegetation and ground disturbance.

Incorporation of environmental protection measures, including compliance with regulatory permit terms and conditions, would serve to minimize the release of sediments and other materials into the river channel. It is expected that such measures would prevent the elevation of turbidity levels above unacceptable levels. Additionally, because of the scope and duration of the construction activities, the construction contractor would be responsible for water quality monitoring at designated sampling sites up and downstream of the construction activity to confirm that water quality objectives are being met. The details of this monitoring program would be determined through the permitting and consultation with RWQCB. Should the monitoring results indicate an unacceptable increase of turbidity levels due to construction, the lead agencies, in consultation with the RWQCB, would develop and implement additional protective measures to prevent significant water quality impacts.

Construction activities also would comply with the Corps' Nationwide Permit, and the RWQCB's Water Quality Certification and NPDES Permit, which necessitate measures that would minimize increases in sedimentation and turbidity. These measures would be documented in a construction erosion and sedimentation control plan to be developed and approved prior to commencement of construction. The plan would identify the specific BMPs for control of sediment transport, including specific regulatory permit terms. The BMPs would be identified in the construction specifications. Specific BMPs that may be incorporated into the plan for the selected alternative are listed under Section 3.7.2.5, Environmental Protection and Mitigation Measures.

Additionally, the NPDES Permit compliance would include development and implementation of a stormwater pollution prevention plan (SWPPP) for the construction site, including staging areas. Required elements of the SWPPP include:

- ❑ Specific erosion and sediment control practices;
- ❑ Post-construction controls; and
- ❑ Monitoring and inspection.

The relationship of the project site to the nearest water supply intakes and the planned closure of the river in the vicinity of construction activities further minimize the potential for water quality to affect these uses. The distance to the nearest water supply intakes at Folsom Dam (13 to 14

miles) combined with the sedimentation that occurs in the reservoir would reduce the potential for impacts upon drinking water quality.

Implementation of the BMPs and compliance with regulatory permit terms and conditions would result in a less-than-significant impact upon the downstream water quality and designated beneficial uses.

Increases in sedimentation and turbidity due to the Proposed Project would be expected to be greater than during No Action/No Project Alternative seasonal pump station construction activities, but would be mitigated through implementation of specific BMPs, such as the ones listed above, or others as determined appropriate for the project through consultation and permitting with regulatory agencies.

Impact 3.7-3: Operation and maintenance activities could increase sediment and turbidity in the river and affect the quality of water available for downstream beneficial uses.

Short-term maintenance activities generally are assumed to not violate water quality objectives. Short- and long-term maintenance activities would be performed in compliance with regulatory permit terms and conditions. These conditions typically specify minimization of water quality impacts by limiting all in-river activities to the extent practicable and requiring proper disposal of excavated materials away from the river channel. For longer-term maintenance activities (e.g., a week-long activity occurring more than once a month), turbidity monitoring upstream and downstream of the diversion structure would be required to determine if activities are in compliance with water quality objectives. If turbidity is increased by more than 1 NTU, maintenance practices would be modified to decrease sedimentation disturbance. Compliance with these measures would ensure that maintenance-related activities of the Proposed Project result in less-than-significant water quality impacts at and downstream of the project site, thereby protecting downstream beneficial uses.

The Proposed Project maintenance activities generally would result in the same types of potential impacts at the project site, primarily the potential to disturb ground surfaces adjacent to the river channel from on-site travel, or the river bed due to in-river dredging. Under the Proposed Project, the need for in-river work likely would be reduced to once every three or four years, depending upon the effects of seasonal flooding upon the diversion structure, compared to annual dredging performed as part of the seasonal pump station activity. As described above, the Proposed Project maintenance activities would be in compliance with regulatory permits and prevent the increase of sedimentation and turbidity levels in compliance with state standards. It is anticipated that the Proposed Project would result in a less than significant water quality impact compared to existing and No Action/No Project Alternative conditions.

Impact 3.7-4: Use of the public river access sites and associated road and trail improvements could increase runoff contaminants and increase turbidity in the North Fork American River.

Use of the river access parking areas potentially would involve up to 53 cars at one time on a peak summer day. These vehicles could result in increased contribution of oil or other contaminants to local surface water runoff. Using stormwater control BMPs, the parking areas

would be designed to reduce the potential for direct contribution of vehicle-related materials to the river.

Additionally, the public river access areas would include installation of sanitary facilities including restrooms and trash containers to minimize potential water quality impacts from increased human activity in the project area. Based on the limited use of the area and inclusion of proper drainage and sanitary improvements, increased use of the area is anticipated to have a less-than-significant impact on water quality.

It is also noted that the Proposed Project would not result in use of motorized watercraft in the project area, therefore, pollutants associated with motorized watercraft would not be introduced to the project area.

Upstream Diversion Alternative

Impact 3.7-5: Construction activities could increase sediment and turbidity in the river, which could affect the quality of water available for downstream beneficial uses.

Construction activities for the Upstream Diversion Alternative would be similar to the Proposed Project, however, the dewatered river channel would not be restored and the public river access sites would not be developed. A much smaller quantity of excavation would take place (72,000 cubic yards). As with the Proposed Project, construction activities result in the potential to increase sedimentation and turbidity in the American River at and downstream of the project site, possibly affecting the quality of water available for downstream beneficial uses.

The environmental protection measures and permit compliance requirements described for the Proposed Project (Impact 3.7-2) generally would be the same for the Upstream Diversion Alternative. Implementation of these measures would result in less-than-significant impacts upon the quality of water available for downstream drinking water and recreation uses.

Sedimentation and turbidity increases would potentially be greater under the Upstream Diversion Alternative than under the No Action/No Project Alternative; however, due to the implementation of environmental protection measures, turbidity levels in the river are not anticipated to increase above acceptable levels. These activities therefore represent a less-than-significant impact.

Impact 3.7-6: Operation and maintenance activities could increase sediment and turbidity in the river and affect the quality of drinking water available to downstream users.

Maintenance activities under the Upstream Diversion Alternative would be similar to those required for the Proposed Project. As for the Proposed Project (see Impact 3.7-3), the Upstream Diversion Alternative maintenance practices would include water quality protection measures and monitoring for turbidity to ensure levels do not increase by more than 1 NTU. These practices would therefore result in less-than-significant effects upon local and downstream water quality. As for the Proposed Project, the impact upon downstream water quality for drinking water and recreation uses would be less than significant.

Cumulative Facilities-Related Impacts

Impact 3.7-7: Construction, operation and/or maintenance of the alternatives could contribute to cumulative water quality impacts which could affect the quality of water available for downstream beneficial uses.

Because the Proposed Project or alternatives would incorporate extensive measures to minimize and prevent potential water quality impacts, the project is not anticipated to result in a contribution to cumulative water quality impacts for the North Fork American River. Additionally, ongoing and future activities within the canyon (such as annual installation of the seasonal pumps and future planned projects involving Foresthill Bridge) already include or would be required to incorporate similar protection measures to minimize degradation of river water quality.

Assuming implementation of project-specific environmental protection measures and compliance with permit terms and conditions (see Impacts 3.7-2, 3.7-3, and 3.7-4), the alternatives would result in a less-than-significant contribution to cumulative facilities-related impacts upon water quality.

Diversion-Related Impacts

The diversion-related analysis refers to certain tables and graphs prepared to provide additional representation of the modeling results and comparison of simulated conditions. These tables and figures are included in Appendix H to the Draft EIS/EIR and are labeled by the appendix letter, resource section number, and ordered as it is referenced in the impact analysis (H-3.6-1, H-3.6-2, etc.). Additionally, the reader is referred to the Hydrologic Modeling Technical Memorandum (Appendix E of the Draft EIS/EIR) and to the model data output (Appendix I of the Draft EIS/EIR).

The only potential diversion-related effect to water quality in the upper American River would be to water temperature in the river below the diversion site. These effects are addressed in Section 3.5, Fish Resources and Aquatic Habitat.

No Action/No Project Alternative

The increased pump station diversion under the No Action/No Project Alternative would be less than evaluated for the Action Alternatives (see below). Based on the evaluation of modeling performed for the Action Alternatives, it is expected that the No Action/No Project Alternative would not result in significant increases in contaminant concentrations downstream of the project site or in other CVP system water bodies.

Proposed Project and Upstream Diversion Alternative (Action Alternatives) Compared to the Existing Condition

The Proposed Project and the Upstream Diversion Alternative would result in the same timing and quantity of increased diversions from the American River. Changes in CVP or SWP

operations associated with the Action Alternatives also would be the same. Therefore, the diversion-related analysis presented below represents the potential impacts that could occur with the Action Alternatives.

Impact 3.7-8: Increased diversions could result in increased concentration of contaminants in the North Fork American River, which could affect the quality of drinking water available downstream and at other locations in the CVP system.

Increased diversions from the North Fork American River associated with an Action Alternative could be expected to reduce storage levels in Folsom Reservoir and to reduce flows in the lower American River. Because the CVP reservoirs are operated in an integrated fashion, reduced storage levels in Folsom Reservoir have the potential to affect storage levels in Shasta and Trinity reservoirs and to affect flows in the Sacramento River and into the Delta.

Reduced contribution of high quality flows from the North Fork American River can potentially affect water quality in downstream water bodies by reducing dilution flows. The potential for this indirect effect on water quality would be greatest during the summer time when flows were already low. Loss of dilution is most important where a high quality flow is diluting a poor quality water flow. However, since the North Fork American River and Folsom Reservoir are of relatively high quality water, the importance of dilution is minor.

Reduction in water flows in the lower American River and reduction in storage levels in Folsom Reservoir due to the Action Alternatives would not be substantial when compared to existing conditions. Long-term average storage levels in Folsom Reservoir would be reduced by less than 1 percent. Long-term average flows in the lower American River would be reduced by less than 2 percent. Lower Sacramento River flows would be reduced by less than 0.1 percent on average. Shasta Reservoir and Trinity Reservoir storage levels would be reduced by less than 0.1 percent as a long-term average. Upper Sacramento River flows would be changed even less. These small reductions in dilution flows, acting indirectly on concentrations or levels of water quality parameters have only a small potential to impact water quality.

Levels or concentrations of water quality parameters of interest such as nutrients, pathogens, total dissolved solids, total organic carbons, turbidity, and priority pollutants (e.g., metals, organics) would not be expected to be altered substantially, if at all, by the Action Alternatives. Any direct or indirect impacts to water quality in downstream or other CVP project area water bodies resulting from reductions in North Fork American River flows would be less than significant.

Overall, measurable increases in constituent concentrations/levels that could occur under the project alternatives would not be expected to be sufficiently large to cause state or federal drinking water quality criteria or standards to be exceeded in the downstream or project area water bodies when they would not otherwise be exceeded. Therefore, impacts to water quality due to the Proposed Project or Upstream Diversion Alternative would be less than significant.

Impact 3.7-9: Impacts to Delta water quality.

Throughout the entire 70-year period of record included in the analysis, Delta outflow reductions of more than three percent occurred during only seven individual months (out of 350 months) under the Action Alternatives relative to the existing condition. Under the Action Alternatives, there would be no shift in the long-term average position of X2 relative to the existing condition.

The model simulations conducted for the Action Alternatives included conformance with X2 requirements set forth in the SWRCB Interim Water Quality Control Plan, as well as Interior's Final Administrative Proposal for the Management of 3406(b)(2) Water. Therefore, the Delta export-to-inflow ratios under the Action Alternatives would not exceed the maximum export ratio as set by the SWRCB Interim Water Quality Control Plan. Overall, impacts to Delta water quality would be considered less than significant.

Impact 3.7-10: Impacts to Oroville Reservoir or Feather River water quality.

The Action Alternatives would not result in substantial changes in storage or elevation at Oroville Reservoir, or in flow in the Feather River, relative to the existing condition. Any small changes that might occur would be considered less-than-significant impacts upon water quality and related beneficial uses. See discussion under Impact 3.7-8.

Proposed Project and Upstream Diversion Alternative (Action Alternatives) Compared to the No Action/No Project Alternative in the Future (2025)*Impact 3.7-11: Increased diversions could result in increased concentration of contaminants in the North Fork American River, which could affect the quality of drinking water available downstream and at other locations in the CVP system.*

Increased diversions from the North Fork American River associated with the Action Alternatives as compared to the future No Action/No Project Alternative could be expected to reduce storage levels in Folsom Reservoir and to reduce flows in the lower American River. Because the CVP reservoirs are operated in an integrated fashion, reduced storage levels in Folsom Reservoir have the potential to affect storage levels in Shasta and Trinity reservoirs and to affect flows in the Sacramento River and into the Delta.

Reduction in water flows in the lower American River and reduction in storage levels in Folsom Reservoir due to the Action Alternatives would not be substantial compared to the No Action/No Project Alternative. Long-term average storage levels in Folsom Reservoir would be reduced by less than one percent. Long-term average flows in the lower American River would be reduced by less than two percent. Lower Sacramento River flows would be reduced by less than 0.1 percent on average. Shasta Reservoir and Trinity Reservoir storage levels would be reduced by less than 0.1 percent as a long-term average. Upper Sacramento River flows would be changed even less. These small reductions in dilution flows, acting indirectly on concentrations or levels of water quality parameters have only a small potential to impact water quality.

Levels or concentrations of water quality parameters of interest would not be expected to be altered substantially, if at all, by the Action Alternatives. Any direct or indirect impacts to water quality in these water bodies resulting from reductions in North Fork American River flows or Folsom Reservoir storage would be less than significant.

Overall, measurable increases in constituent concentrations/levels that could occur under one of the Action Alternatives would not be expected to be sufficiently large to cause state or federal water quality criteria or standards to be exceeded in the downstream or project area water bodies when they would not otherwise be exceeded. Therefore, impacts to water quality due to the Action Alternatives relative to the No Action/No Project Alternative would be less than significant.

Impact 3.7-12: Impacts to Delta water quality.

Reductions in the long-term average Delta outflow of up to 0.3 percent for any given month would occur under the Action Alternatives relative to the No Action/No Project Alternative, as shown in Table H-3.5-51. In 40 of the 840 months simulated, the Delta outflow was reduced by more than one percent relative to the future No Action/No Project Alternative. There were only eight months out of the 840 months included in the analysis, or about one percent of the time, when the Delta outflow would decrease by more than three percent under the Action Alternatives relative to the No Action/No Project Alternative.

Under the Action Alternatives, there would be only a 0.1 km upstream shift in one month's long-term average position of X2 relative to the long-term average position under the No Action/No Project Alternative.

The Delta export-to-inflow ratios under the Action Alternatives relative to the No Action/No Project Alternative would not exceed the maximum export ratio as set by the SWRCB Interim Water Quality Control Plan. Overall, impacts to Delta water quality would be less than significant.

Impact 3.7-13: Impacts to Oroville Reservoir or Feather River water quality.

The Action Alternatives would not result in substantial changes in storage or elevation at Oroville Reservoir, or in flow in the Feather River, relative to the No Action/No Project Alternative. Any small changes that might occur would be considered less-than-significant impacts upon water quality and related beneficial uses. See discussion under Impact 3.7-11.

Cumulative Impacts

The cumulative effects were determined based on a comparison of the future condition with implementation of an Action Alternative plus other reasonably foreseeable actions or projects (cumulative condition) to existing conditions. In instances where potentially significant or significant effects are identified, there is a further analysis to determine the Action Alternatives' incremental contribution to the cumulative condition. The reader is referred to Appendix E for

further explanation of the modeling methodology and assumptions and Appendix I for results from the simulations.

Impact 3.7-14: Increased diversions could result in increased concentration of contaminants in the North Fork American River, which could affect the quality of drinking water available downstream and at other locations in the CVP study area.

Changes in operation of the CVP system associated with the cumulative condition could be expected to substantially reduce storage levels in Folsom, Shasta, Trinity, and Oroville reservoirs and to substantially reduce flows in the lower American River, Sacramento River, and Feather River compared to existing conditions. Long-term average storage levels would be reduced by up to 11 percent in Folsom Reservoir, up to 7 percent in Shasta Reservoir, up to 5 percent in Trinity Reservoir, and up to about 8 percent in Oroville Reservoir. Long-term average flows would be reduced by up to 15 percent in the lower American River, up to 10 percent in the upper Sacramento River, up to 5 percent in the lower Sacramento River, and up to about 14 percent in the lower Feather River. The greatest reduction in flow would be in September, October and November - months when the existing flow is already low. These reductions in dilution flows, acting indirectly on concentrations or levels of water quality parameters have potential to impact water quality.

Increases in constituent concentrations or levels that may occur under the cumulative condition could be sufficiently large to cause state or federal water quality criteria or standards to be exceeded in the downstream or project area water bodies when they would not be exceeded in the existing condition. Therefore, impacts to water quality due to the cumulative condition relative to the existing condition are potentially significant.

Action Alternatives' Incremental Contribution to the Cumulative Condition

Impacts on water flows and storage levels associated with the Action Alternatives would be small. Long-term average storage levels would be reduced by less than 1.2 percent in Folsom Reservoir, by less than 0.1 percent in Shasta Reservoir, by less than 0.2 percent in Trinity Reservoir, and by less than 1 percent in Oroville Reservoir. Long-term average flows would be reduced by less than 2 percent in the lower American River, by less than 0.2 percent in the upper Sacramento River, by less than 0.3 percent in the lower Sacramento River, and by less than 1 percent in the lower Feather River. These reductions in dilution flows, acting indirectly on concentrations or levels of water quality parameters would have negligible contribution to the cumulative impacts on water quality.

The Action Alternatives' incremental contribution to the cumulative condition water quality would be less than significant.

Impact 3.7-15: Impacts to Delta water quality.

The greatest reductions in the long-term average Delta outflow under the cumulative condition was 8.3 percent (during the month of October) relative to the existing condition, as shown in

Table H-3.5-88. The long-term average position of X2 would move upstream less than one kilometer relative to the existing condition.

The Delta export-to-inflow ratios under the cumulative condition would not exceed the maximum export ratio as set by the SWRCB Interim Water Quality Control Plan. Even though the cumulative condition would not cause X2 or Delta outflow standards to be violated, the cumulative condition could result in decreased outflow and upstream shift in the position of X2, which could be considered a potentially significant impact to Delta water quality. Overall, impacts to Delta water quality would be potentially significant.

Action Alternatives' Incremental Contribution to the Cumulative Condition

The incremental contribution analysis indicates that reductions in the long-term average Delta outflow of up to 0.3 percent could occur under the cumulative condition relative to the future base condition, as shown in Table H-3.5-89. In addition, under the cumulative condition, there would not be more than a 0.1 km shift in the long-term average position of X2 relative to the future base condition. The Delta export-to-inflow ratios under CVP operations associated with the Action Alternatives would not exceed the maximum export ratio as set by the SWRCB Interim Water Quality Control Plan. Based on these and the above-discussed results, implementation of the year-round pump station project would not significantly contribute to future potentially significant impacts to Delta water quality.

3.7.2.5 Environmental Protection and Mitigation Measures

The Proposed Project or Upstream Diversion Alternative would include incorporation of environmental protection measures, as described in the impact analysis. These measures, plus regulatory permit terms and conditions would ensure protection of water quality at and downstream of the project site.

The mitigation measures included in the Mitigation Plan (Appendix D to the Final EIS/EIR) are provided below.

Removal of Construction Litter and Debris

Commitment:	Remove litter and construction debris from the Project area and dispose of at an appropriate site.
Responsible Parties:	Reclamation/Construction Contractor - On-site Monitor
Location:	Project area
Timing:	During all phases of construction (2002 through 2004), as needed
Monitoring:	Inspect construction areas for compliance with litter and debris control measures
Reporting Requirements:	Construction compliance reports/daily inspector reports

Description of Activities:

Reclamation will require Construction Contractor to keep site clear of construction-related litter and debris; specifically, in areas near the river channel.

Success Criteria:

No litter or construction debris is noted in the Project area, on inspection.

Construction-Related Water Quality Protection Measures

Commitment:	Stormwater runoff control measures that prevent contaminants, soil or sediment from entering the river shall be implemented, monitored for effectiveness, and maintained throughout construction operations. The specific measures to be implemented for this project will be determined as part of the permitting process prior to construction. Construction specifications will include all required measures indicated in permits for erosion control, stormwater runoff control, and dewatering specifics.
Responsible Parties:	Reclamation/Construction Contractor - On-site Monitor
Location:	Construction areas
Timing:	During all phases of construction (2002 through 2004)
Monitoring:	Inspect construction areas for compliance with water quality control measures
Reporting Requirements:	Construction compliance reports/daily inspector reports

Description of Activities:

Reclamation will require the Construction Contractor to implement terms and conditions of regulatory permits including all applicable construction BMPs for stormwater runoff and erosion control to minimize the potential for direct release of materials to the river during Project construction.

The Construction Contractor will be responsible to meet the terms of the permit(s). Should monitoring or site inspection indicate unacceptable conditions due to construction, the lead agencies, in consultation with the RWQCB or other permitting agencies, will develop and implement additional protective measures to prevent water quality impacts.

The Project water quality protection measures to be required by permitting agencies may include one or more of the following:

- ☐ Terms limiting the period or type of construction activities that occur within the ordinary high water line of the American River up- and downstream of the bypass tunnel.
- ☐ Restrictions upon storage and stockpiling of construction materials, including vehicles and supplies, and chemicals or other hazardous materials to designated construction staging areas.
- ☐ Designation of vehicle/equipment fueling and wash-down areas, away from the floodway and designed to contain potential spills.

- ❑ Regular maintenance of construction vehicles and equipment such that leaks of fuels, lubricants and other materials are prevented.
- ❑ Removal of construction litter/debris and proper disposal practices at the end of each construction day and particularly prior to the start of the rain season.
- ❑ Requirement to minimize near and in-river activities to the extent possible.
- ❑ Implementation of post-construction management activities including restoration or improvement of drainage patterns and stabilization of stream banks and hillsides (upland areas) within the construction area; stabilization may include revegetation with a seed mix of plants native to the area, mulch or some other form of protection.

Success Criteria:

Document permit compliance in construction compliance report or as required by individual permitting agencies.

Project Operation and Maintenance Water Quality Protection

Commitment:	Protect downstream beneficial water uses by incorporating standard BMPs into the operation and maintenance of the Project to avoid water quality impacts.
Responsible Party:	PCWA
Location:	Project area/river channel
Timing:	Project operation and maintenance
Monitoring:	As required by permitting agencies
Reporting Requirements:	Comply with regulatory permit reporting requirements

Description of Activities:

PCWA will comply with regulatory permit terms and conditions in all short- and long-term maintenance activities for the pump station, intake facilities, and diversion structure.

Success Criteria:

Document compliance with regulatory permit terms and conditions.

Minimize Water Quality Impacts From Increased Public Access

Commitment:	Reduce the potential for pollutants to enter the river.
Responsible Party:	Reclamation
Location:	Project area (public river access features)
Timing:	Ongoing during operation of public river access
Monitoring:	Monitor use of parking areas such that capacity is not exceeded; monitor proper functioning of drainage control structures; and track public sanitation facility maintenance.

Reporting Requirements: No specific reporting requirement.

Description of Activities:

Reclamation will ensure that design of the public river access features limits the number of cars permitted into the Project area and further restricts the proximity of vehicles to the river. Reclamation will ensure that the design incorporates drainage control structures into all access roads, trails and parking areas to reduce direct contribution of pollutants into the river.

Through its Auburn SRA management agreement, Reclamation will require CDPR to maintain the public river access facilities such that trash containers will be emptied and restrooms will be cleaned regularly to avoid accumulation of litter in the Project area.

Success Criteria:

Public river access area is maintained appropriately and water quality/pollution impacts avoided.

3.8 RECREATION

3.8.1 AFFECTED ENVIRONMENT

3.8.1.1 Regional Setting

The regional setting includes recreation areas or facilities that may be influenced by the Proposed Project or alternatives through reductions in flows or reservoir elevations due to changed CVP or SWP operations that affect water-based or water-enhanced recreation of the water body. Regional water resources included in this evaluation include: Trinity and Shasta reservoirs, the upper and lower Sacramento River, Folsom Reservoir, Lake Natoma, the lower American River, the Delta, Oroville Reservoir, and the Feather River. Descriptions of the water-based recreation activities associated with these waterways and water bodies are included in the Cumulative Report (Appendix D of the Draft EIS/EIR).

3.8.1.2 Project Area Setting

The project area represents the direct effect study area and encompasses the water-based recreation resources of the Middle Fork American River below Ralston Afterbay and the North Fork American River from the confluence with the Middle Fork to just downstream of Oregon Bar (Figure 2-2).

Middle Fork American River

The Auburn State Recreation Area (SRA) is managed by the CDPR and receives approximately 850,000 visitors annually (CDPR 2002). The Middle Fork American River from below Ralston Afterbay lies within the Auburn SRA and extends 24 miles downstream to the confluence with the North Fork. The Auburn SRA includes approximately 40,000 acres of lands withdrawn for the proposed Auburn Dam and Reservoir Project. Twenty-five thousand acres are managed by CDPR under the 1977 agreement with Reclamation. The remaining 15,000 acres are scattered throughout the canyon and are either privately owned or federal lands. Broad management guidelines for the public use area of Auburn Dam Project lands were established under Public Law 89-161, the enabling legislation for the construction of Auburn Dam.

The Middle Fork American River is the most popular river in the Auburn SRA for whitewater boating. Water released from the PCWA MFP through Ralston Afterbay supports rafting, kayaking, and canoeing throughout the year. PCWA currently has an informal arrangement with Middle Fork American River commercial whitewater companies to release water from Ralston Afterbay on weekend mornings to augment flows down the river for whitewater use. Releases of 1,000 to 1,100 cfs typically are released beginning at 7:00 a.m. and continue to be released for several hours, depending on water operations (Anderson 1998).

Water released at 7:00 a.m. usually reaches the confluence of the Middle and North Forks at approximately 3:00 p.m. The released water provides river boating opportunities along the Middle Fork. These releases are particularly important during the summer and early fall months

when river flows may be below 300 cfs. Adequate flows for whitewater boating are above 1,000 cfs and the minimum flow needed is approximately 800 cfs (Cassady and Calhoun 1995; T. Reed, pers. comm. 1998; Anderson 1998).

Most whitewater boating occurs in the summer (97 percent of the year's whitewater use), with the boating season beginning in late May and extending into September (CDPR and Reclamation 1992). The majority of the river stretches along the Middle Fork American River tend to be difficult whitewater and require intermediate to advanced level skills, or the services of a commercial rafting company (Anderson 1998). There are three distinct whitewater runs on the river: (1) the Tunnel Chute run; (2) the Mammoth Bar run; and (3) Murderer's Bar run. The Tunnel Chute run extends from just below Ralston Afterbay to the old Greenwood Bridge site. It is a Class IV run with one Class V rapid and a portage. The Mammoth Bar Run is a Class II run which extends from the old Greenwood Bridge site to Mammoth Bar. The Murderer's Bar run extends from Mammoth Bar to the confluence, ending just above the Highway 49 bridge. This run is a Class IV with one Class V rapid. The confluence area offers the last takeout point above the project site. **Figure 3.8-1** provides a map of recreational opportunities along the Middle Fork American River.

North Fork American River

Boating and other water-related activities are discouraged downstream of the confluence to the project site (CDPR and Reclamation 1992) and prohibited within the area 1/2-mile upstream and 1/2-mile downstream of the Auburn Dam construction bypass tunnel (posted CDPR order #318-02-91) due to hazards associated with the bypass tunnel (Anderson 1998, CDPR 2000). At normal river stages, the entire flow of the river is diverted into the bypass tunnel, which presents hazards that may not be evident until after a boater has entered the tunnel. Specifically, river-borne debris such as logs can become lodged in the tunnel and pose a significant pinning or drowning hazard to boaters or swimmers. At 4,000 cfs, the tunnel is passable with a four-foot high gap at the downstream tunnel portal, according to the most recent engineering survey of the area (MW et al. 1998). However, at flows greater than 10,000 cfs, the upstream tunnel portal can be entered while the downstream tunnel portal is completely submerged. Although undocumented, noncommercial whitewater boating, fishing, and swimming are known to occur in the area (J. Dampier, pers. comm. 1998).

Project Area River Characteristics

Currently, the Auburn reach of the North Fork American River is divided into two segments by the dam construction site. If boating were allowed in the project area, the stretch above the bypass tunnel would be an easy Class I to Class II river trip through a narrow canyon appropriate for novice boaters, families, and unguided trips with one Class II+ rapid (Tamaroo Bar Rapid). These river characteristics would be suitable for use by individuals with a wide range of boating skills. This trip would begin with a short warm-up leading directly into fairly long cobble bar type rapids with swift water and a tricky left turn against a rock face near the bottom.

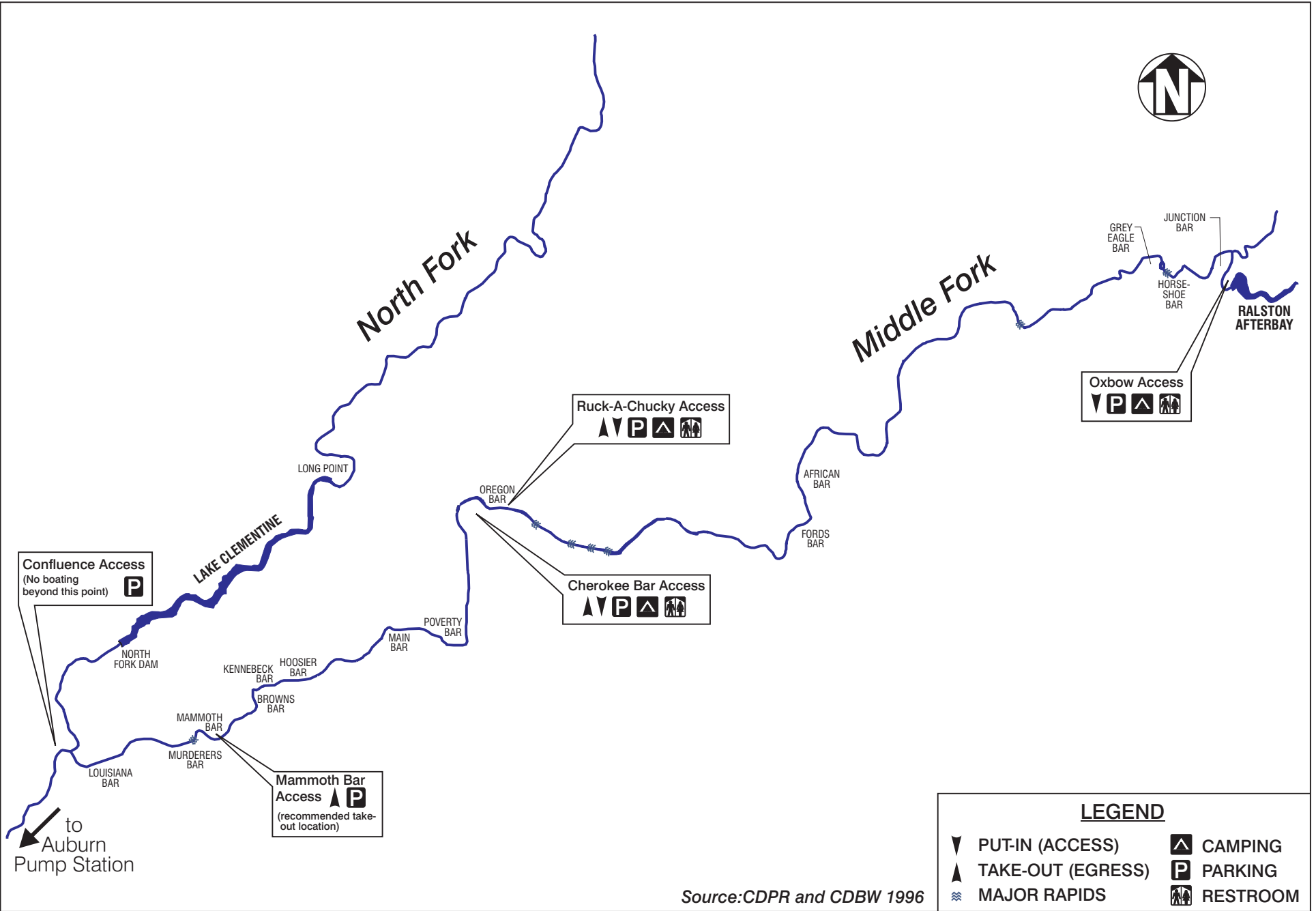


Figure 3.8-1 Recreational Opportunities Along the Middle Fork American River

Downstream of the project area, steeper, longer, and more closely spaced rapids increase the difficulty of the stretch to a Class II to Class III run. This downstream segment of the river supports a large volume of cofferdam remnants, which makes the riverbed unstable. As a result, the rapids tend to change with each flood event (Anderson 1998; Anderson 2002).

Increased boating opportunities below the Middle Fork/North Fork confluence would be open to non-motorized river uses, including canoes, kayaks, and rafts. Motorized boating currently is prohibited by posted order on the rivers of the Auburn SRA (with the exception of Lake Clementine). The posted order would apply to the river reach within the project area. Commercial whitewater boating is prohibited on the North Fork American River between the Middle Fork/North Fork confluence and the project area. No commercial river use is proposed as part of this project; nor is any being considered by CDPR at this time. Any future consideration of commercial river activities would require separate feasibility study, planning, environmental review and analysis.

Other river-related uses that have been known to occur within the project area include fishermen who use the river below the diversion tunnel, swimmers and others who use the beach area along the river below Robie Point and use the stretch of river between the Middle Fork/North Fork confluence and the Auburn Dam site by hikers, sunbathers and anglers.

Project Area Trail Use

Although boating is either discouraged or prohibited in areas downstream of the Middle Fork/North Fork confluence to approximately 1/2-mile below the project site (CDPR and Reclamation 1992), the North Fork American River canyon provides opportunities for hiking, biking, sight-seeing, and horseback riding. As with other areas in the region, May through September are peak use months for these activities.

The Auburn SRA has a system of trails, which provide access for a variety of uses including hiking and trail running, equestrian, and mountain biking (**Figure 3.8-2**). The Auburn-to-Cool Trail is a multi-use trail used by hikers, mountain bikers, and equestrians. The trail extends from Auburn, down the western side of the river canyon in the project area, crosses the southwestern end of the dewatered river channel, passes up onto the cofferdam remnants and then follows the eastern canyon wall of the river before heading east towards Cool (Figure 3.8-2). From the east side of the river, the Auburn-to-Cool Trail intersects with other Auburn SRA trails which provide access to the towns of Foresthill and Georgetown, and to other recreational use areas such as Knickerbocker Flat, Lake Clementine, and the river canyons of the North and Middle forks. The trail became widely used during closure of Mountain Quarries Bridge (otherwise known as No Hands Bridge) in 1996, located just downstream of the Highway 49 river crossing (Mountain Quarries Bridge/No Hands Bridge has since been re-opened).

A trail counter installed in November and December of 2001 on the Auburn-to-Cool Trail counted 589 trail uses. Based on seasonal use patterns, CDPR estimated the two-month count to equate to 2,500-3,500 annual trail users. The Auburn-to-Cool Trail intersects the Western States Trail, a nationally registered trail that extends from Sacramento to Utah. The Western States Trail begins in the Auburn Staging Area, located near the Gold Country Fairgrounds in Auburn,

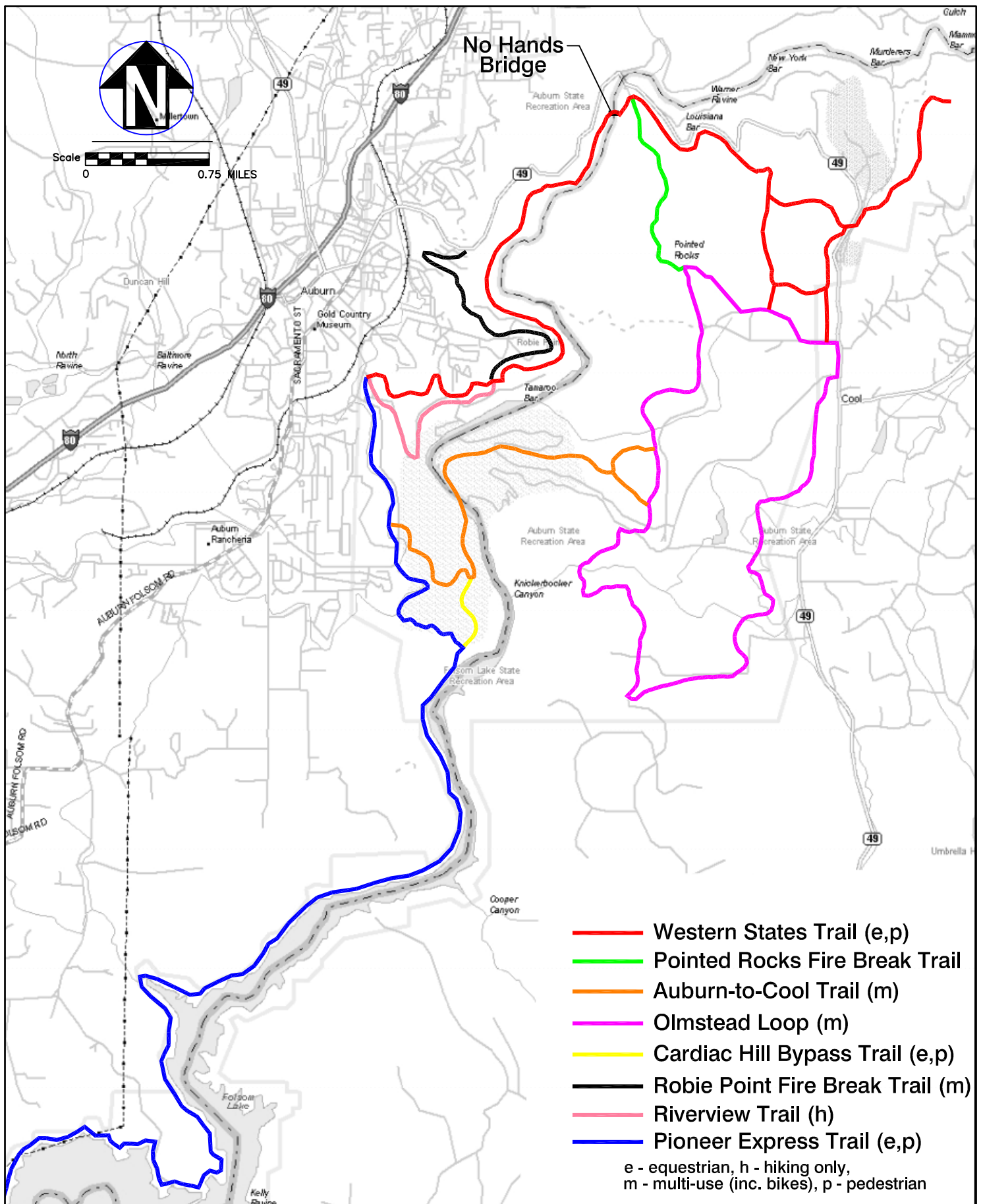


Figure 3.8-2 American River Pump Station Project Area, Recreation Trails Map

passes down to the confluence of the Middle and North forks of the river, along the Middle Fork, and then into the Sierra Nevada Mountains. The Western States trail is the main trail along the Middle Fork and intersects with other Auburn SRA trails (CDPR and Reclamation 1992). Two recreational events of national significance held on the Western States route and which pass through the SRA are the Tevis cup endurance ride (100 miles) and the Western States Endurance Run (100 miles).

Other recognized trail systems within the vicinity of the project area include the Cardiac Hill Trail, the Pioneer Express Trail, and the Robie Point Firebreak Trail. Despite the officially designated closure of the area to public use, the area has many unofficial trails and construction roads that are used by the public.

3.8.2. ENVIRONMENTAL CONSEQUENCES/IMPACT ANALYSIS

3.8.2.1 Methodology

Facilities-Related Analysis Approach

The anticipated construction, operation, and maintenance impacts on recreation were assessed in part by consulting with Reclamation and CDPR staff. Specifically examined were the location and nature of project components, changes in access roads and access to the river, changes in boating and swimming opportunities or trail access, and potential hazards to recreationists.

Diversion-Related Analysis Approach

Diversion-related effects were evaluated for the Middle Fork American River, Folsom Reservoir, Lake Natoma, the lower American River, Sacramento River reservoirs, the upper and lower Sacramento River, and the Delta. The project alternatives' increased water diversions may result in reductions in river flows and reservoir storage volumes. To evaluate diversion-related impacts to regional water bodies, therefore, recreation impacts were analyzed based on a comparison of reservoir elevations and river flows under existing conditions and project alternative conditions (over a 70-year period of record). The cumulative analysis of recreation impacts is based on a comparison of these parameters under cumulative and existing conditions. In instances where a potentially significant or significant cumulative impact is identified, further analysis was performed to assess the project's incremental contribution to the future cumulative condition.

Hydrologic modeling results were reviewed to determine whether the magnitude of reductions in elevations or flows would affect recreation on these water bodies. The model simulations and comparisons are described in Section 3.3.2. Additional details of the hydrologic modeling are included in Appendix E of the Draft EIS/EIR.

3.8.2.2 Applicable Laws, Ordinances, Regulations, and Standards

Auburn State Recreation Area Interim Resource Management Plan

CDPR, through a management agreement with Reclamation, manages the public use of the Reclamation lands in the Auburn SRA. The area supports and offers the potential for unique and diverse recreational opportunities. The Auburn Interim Resource Management Plan provides planning goals and objectives to address agency and public concerns for protection and enhancement of recreation and natural resources of the area. CDPR and Reclamation will soon be undertaking efforts to update this plan. These efforts will include re-assessment of existing resources, public interests, and possible improvements to accommodate recreation while protecting the natural resources and primitive setting of the upper American River reaches.

American River Parkway Plan

The American River Parkway Plan was adopted by the County of Sacramento in 1985 (Sacramento County 1985). The plan is an element of the Sacramento County General Plan. It establishes goals and policies for the parkway, presents a description of parkway resources, and provides area plans to guide resource protection and development. Policy 3.1 of the plan discusses flow issues, as follows:

"Water flow in the lower American River should be maintained at adequate levels to permanently sustain the integrity of the water quality, fisheries, waterway recreation, aesthetics, riparian vegetation, wildlife, and other river-dependent features and activities of the Parkway. The required flow levels of the lower American River should be established at higher levels than those required under Decision 1400 of the State Water Resources Control Board. State and federal policy should provide for the maintenance of flows in the optimum range in the lower American River."

The plan explains that Decision 1400 flows (e.g., 1,500 cfs for recreation) are inadequate and that the decision has no legal effect without the completion of the Auburn Dam. It acknowledges that research is ongoing to establish adequate flows for the lower American River, including recreation flows. When required flows are determined, the plan states that "those flows will be incorporated into the policies of this Plan."

State Wild and Scenic Rivers Act

The State Wild and Scenic Rivers Act was passed by the California Legislature in 1972 (Public Resources Code (PRC) Section 5093.50 *et seq.*). The Legislature declared that it was the state's intent that "certain rivers which possess extraordinary scenic, recreation, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state." The Act restricts the construction of dams, reservoirs, diversions, and other water impoundments. A diversion facility may be authorized if the Secretary of the Resources Agency determines that (a) it is needed to supply

domestic water to the residents of the county through which the designated river flows, and (b) it will not adversely affect the natural character of the river (PRC Section 5093.55[a]; DWR 1994).

The upper portion of the North Fork American River from Colfax-Iowa Bridge to the upper end of Lake Clementine is eligible for listing for its scenic values. The North Fork American River from below lake Clementine to the bypass tunnel in the project area is eligible for listing for its recreational values. The Middle Fork American River from Oxbow Dam to the confluence with the North Fork American River is eligible for listing for its scenic values (City of Sacramento 1993). The lower American River was included in the state Wild and Scenic River System and was given the classification of “recreational river” (PRC Sections 5093.54[e], 5093.545 [h]). The state defines a recreational river as a river “readily accessible by road or railroad, that may have some development along [its] shorelines, and that may have undergone some impoundment or diversion in the past” (PRC Section 5093.53[c]).

National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers System was established in 1968 with the enactment of P.L. 90-542 (16 USC 1271 *et seq.*). Under this system, rivers possessing “outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values” can (or will?) be protected as wild, scenic, or recreational.

The upper portion of the North Fork from Colfax-Iowa Bridge to the upper end of Lake Clementine is eligible for listing for its scenic values. The North Fork from below lake Clementine to the bypass tunnel in the project area is eligible for listing for its recreational values. The Middle Fork from Oxbow Dam to the confluence with the North Fork is eligible for listing for its scenic values (City of Sacramento 1993). The lower American River from Nimbus Dam to its confluence with the Sacramento River was added to the National Wild and Scenic Rivers System based on the state’s petition in 1981 and is designated a “recreational river.” Recreational rivers are ones “that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past” (16 USC 1273[6][3]).

As a result of its designation under the act, federally assisted projects affecting the lower American River are subject to the Secretary of the Interior’s determination that the project “will not invade the area or unreasonably diminish” the river’s recreational value (16 USC 1278[a]; see also *Swanson Mining Corporation v. FERC*, 790 F.2d 96 [D.C. Cir. 1986]; and the American River Parkway Plan). When seeking authorization or appropriations for a project that affects the protected values of the lower American River, the relevant federal agency must notify the Secretary of the Interior of its intent, and report to Congress on the project’s conformity with the act and its effect on the protected values of the river (16 USC 1278[a]).

El Dorado County General Plan

The El Dorado County General Plan was adopted in 1996 (El Dorado County General Plan 1996). It is a long range statement of local public policy for the use of public and private land, which provides a framework for encouraging economic development while managing growth,

conserving agricultural lands, protecting the environment, developing effective and efficient public services and preserving the County's rural character. The Non-Motorized Transportation Systems component defines a network of regional bikeways and trails that interface with and complement adjacent counties' and local (city) routes. Under this component, Hiking and Equestrian Trails shall be separated from the travel roadway whenever possible by curbs and barriers (such as fences and rails), landscape buffering, and special distance. The plan calls for use of existing public corridors such as power transmission line easements, railroad rights-of-way, irrigation district easements, and roadways for multiple-use trailways, where possible.

3.8.2.3 Impact Indicators and Significance Criteria

Significance criteria for recreational use of the Middle Fork American River were developed from various sources (Cassady and Calhoun 1995; T. Reed, pers. comm. 1998; Anderson 1998). The significance criteria used for recreation use of Folsom, Shasta, and Trinity reservoirs, the lower American River, and the upper and lower Sacramento River and Delta are based on the Water Forum Proposal Final EIR (CCOMWP 1999). The Water Forum Proposal Final EIR presents an extensive review of sources that suggest minimum, maximum, and optimum flows for common recreational activities at each of the water bodies in the regional study area. These discussions and evaluations are herein incorporated by reference. The results of these evaluations and the thresholds of significance that were developed from them in the Water Forum Final EIR are used in this document to evaluate regional recreational impacts. Significance criteria for each of the potentially affected water bodies are presented in **Table 3.8-1** along with other recreational criteria.

Table 3.8-1 Recreation Impact Indicators and Significance Criteria	
Impact Indicators	Significance Criteria
<input type="checkbox"/> Accessibility of recreational trails.	<input type="checkbox"/> Permanent closure of recreation trails through the project site.
<input type="checkbox"/> Recreational safety hazards.	<input type="checkbox"/> A substantial increase in exposure to hazards for recreationists, for either land- or water-based activities.
<input type="checkbox"/> American River public access and river conditions that contribute to water-based recreational activities.	<input type="checkbox"/> A substantial change in river access or channel conditions that contribute to water-based recreational activities, relative to the basis of comparison, with sufficient frequency to adversely affect recreation..
<input type="checkbox"/> Consistency with applicable regulations and planning documents, guiding recreation in the study area.	<input type="checkbox"/> A conflict or inconsistency with relevant policies, plan goals, or objectives relative to the basis of comparison such that recreation would be adversely affected.

Table 3.8-1 (Continued) Recreation Impact Indicators and Significance Criteria	
Impact Indicators	Significance Criteria
<input type="checkbox"/> River flows that determine whitewater rafting and other boating opportunities.	<input type="checkbox"/> A substantial decrease in the duration of Middle Fork flows below the 850 cfs threshold for whitewater boating, relative to the basis of comparison, sufficient to adversely affect recreation. <input type="checkbox"/> A substantial change in lower American River flows above or below the 1,750 to 6,000 cfs minimum/maximum range of adequate recreational flow, relative to the basis of comparison, with sufficient frequency to adversely affect recreation (CCOMWP 1999). <input type="checkbox"/> A substantial change in lower American River flows above or below the 3,000 to 6,000 cfs optimum range of recreational flows, relative to the basis of comparison, with sufficient frequency to adversely affect recreation (CCOMWP 1999). <input type="checkbox"/> A substantial decrease in upper or lower Sacramento River flows below 5,000 cfs or a substantial decrease in flows, relative to the basis of comparison, with sufficient frequency to adversely affect recreation (CCOMWP 1999). <input type="checkbox"/> A substantial decrease in the contribution of lower Sacramento River flows to the Delta, relative to the basis of comparison, with sufficient frequency to adversely affect recreation.
<input type="checkbox"/> Folsom Reservoir water surface elevations that determine boat ramp availability.	<input type="checkbox"/> A change in Folsom Reservoir elevation that would result in a substantial decrease in availability or optimum use of boat ramps, wet slips or swimming beaches, relative to the basis of comparison, with sufficient frequency to adversely affect recreation (CCOMWP 1999): <ul style="list-style-type: none"> ▪ When all boat ramps are useable (420 feet or higher) ▪ When the marina wet slips are useable (412 feet or higher) ▪ When the swimming beaches are useable (420 to 455 feet) ▪ When at least one of the low-water ramps is useable on both the east and west sides of the lake (375 feet or higher) ▪ When the lake level is within its optimum range for high quality recreation activities (435 to 455 feet)

Table 3.8-1 (Continued) Recreation Impact Indicators and Significance Criteria	
Impact Indicators	Significance Criteria
<input type="checkbox"/> Shasta and Trinity reservoir water surface elevations that determine boat ramp availability.	<input type="checkbox"/> A change in Shasta Reservoir elevation that would result in a substantial increase in boat ramp closures, relative to the basis of comparison, with sufficient frequency to adversely affect recreation (CCOMWP 1999): <ul style="list-style-type: none"> ▪ When all boat ramps are useable (1,020 feet or higher) ▪ When at least one boat ramp is useable on each arm of the lake (941 feet or higher) ▪ When recreational use of shoreline areas begins to decline (1,007 feet) <input type="checkbox"/> A change in Trinity Reservoir elevation that would result in a substantial increase in boat ramp closures relative to the basis of comparison, with sufficient frequency to adversely affect recreation (USFWS et al. 1999): <ul style="list-style-type: none"> ▪ When only one major boat ramp is useable (2,170 feet to <2,295 feet)
<input type="checkbox"/> Feather River flows below Oroville Dam for all months of the year.	<input type="checkbox"/> Reservoir water surface elevations that Reservoir water surface elevations that A substantial change in Feather River flows, relative to the basis of comparison, with sufficient magnitude and frequency to adversely affect recreation in the Feather River.
<input type="checkbox"/> Oroville Reservoir water surface elevation.	<input type="checkbox"/> A substantial change in Oroville Reservoir elevation, relative to the basis of comparison, with sufficient magnitude and frequency to adversely affect recreation in Oroville Reservoir.
Source: Water Forum EIR (CCOMWP 1999); Trinity River Mainstem Fishery Restoration Draft EIS/EIR (USFWS et al. 1999)	

3.8.2.4 Impact Analysis

This section presents the analysis of potential facilities- and diversion-related recreation impacts. A summary of the impact issues, level of significance, and environmental protection and mitigation measures is provided in the Executive Summary to the Final EIS/EIR, Table S-5.

Facilities-Related Impacts***No Action/No Project Alternative******Impact 3.8-1: Impacts to public recreation trail access.***

Continued installation and removal of the seasonal pump station under the No Action/No Project Alternative would not affect recreation in the project area beyond that which currently occurs. Because the project site conditions would not change from existing conditions under this alternative, there would be a less-than-significant impact to trails through the area.

Impact 3.8-2: Impacts to public safety.

Construction activities associated with installation and removal of the seasonal pump station, as well as operational activities, would not increase hazards to land or water-based recreational activities within the project area beyond those currently experienced. Because the project site conditions would not change from existing conditions under this alternative, potential hazards associated with unauthorized recreational activities and presence of the bypass tunnel remain a significant issue.

Increased patrolling of the area by Reclamation or CDPR may further reduce but would not eliminate all unauthorized uses. Under this alternative, there would be no feasible means for eliminating the bypass tunnel hazard.

Proposed Project***Impact 3.8-3: Impacts to public recreation trail access.***

Several trails pass around or through the project study area including Pioneer Express, Cardiac Hill, Cardiac Hill Bypass, Auburn to Cool, Riverview, Western States, Robie Point Fire Break, Pointed Rocks Fire Break and Olmstead Loop trails (Figure 3.8-2). Construction of the Proposed Project would not affect public use of the Pioneer Express, Western States, Robie Point Fire Break, Pointed Rocks Fire Break or Olmstead Loop trails.

The Proposed Project would result in temporary closure of recreation trails through the project area during construction, although Reclamation and CDPR would work with special trail event coordinators to provide access through or around the project site such that annual events would not be adversely affected by construction or operation of the Proposed Project. Closure of the bypass tunnel and restoration of North Fork American River flows would result in bifurcation of the Auburn-to-Cool Trail where it currently crosses the dewatered river channel. The Proposed Project also includes development of new trails to provide access to Oregon Bar and along access roads to minimize multiple user conflicts in the area that may result as a result of increased public access in the area.

Closure of active construction areas to restrict public access would be necessary to protect the public and facilitate pump station construction, bypass tunnel closure, and river channel

restoration. Restricted access in the project area is appropriate and required to protect the health and safety of the general public from the various hazards (i.e., heavy construction equipment operations, blasting, extensive earthwork and unsafe materials, including explosives) associated with construction of the Proposed Project as well as to protect the construction area and equipment. The total area closed to public access would vary by construction phase and activity.

Reclamation's construction contractor would place security fencing around all active construction and equipment storage areas and post warning and no trespassing signs at restricted areas. During blasting, the construction contractor would restrict use of portions of the Auburn-to-Cool, Riverview and other project area trails as needed to protect the public from potential injury. Although blasting activities would be confined to relatively small sites within the project area, trail access would be closed at the canyon rim, or at safe distances away from the blasting activity. Such closures would vary in duration depending upon blasting activity. In some instances, trail access detours may be provided to maintain uses in the area; re-routed trails would be indicated by trail markers or other visible cues. Permitted trail use (i.e., equestrian, pedestrian) would be the same as existing designations.

Trail closure information would be provided to the general public through a public outreach program to include local signage (i.e., at the canyon rim on both the Placer and El Dorado county sides), newspaper notices, radio announcements, and coordination with trail advocacy organizations, as determined appropriate. Through these efforts, Reclamation, with assistance from CDPR, would minimize the extent and duration of trail closure impacts and public trail access during construction of the Proposed Project to the extent possible while still addressing public safety concerns and facilitating project construction with minimal disruption. Overall, the temporary impacts due to limitations on public access to project area recreation trails would be reduced to less than significant.

Special annual events utilizing these trails would not be expected to be adversely affected by construction of the Proposed Project. CDPR would work with special event coordinators and Reclamation's construction contractor for annual events including the Western States Endurance Run, Tevis Cup Western States Trail Ride and the American River 50 Mile Endurance Run, and to avoid trail access impacts for these events. Coordination with event sponsors would enable CDPR and Reclamation to ensure safe, adequate passage along event routes for the set-up, operation and break-down/clean-up associated with each event. The impact of the Proposed Project upon these annual trail events would be considered less than significant.

Closure of the bypass tunnel and river channel restoration would result in the bifurcation of the Auburn-to-Cool Trail through the project site. Loss of the Auburn-to-Cool access would be considered a significant unavoidable impact. The lead agencies and CDPR have developed a mitigation measure to prepare a feasibility study evaluating the provision of a multi-use bridge or alternative trail alignment(s) to provide a crossing of the North Fork American River within the Auburn SRA, near the project site. As part of this commitment, PCWA and the State of California would provide funding toward the study and implementation of such a project, if determined to be feasible (see Section 3.8.2.4, Environmental Protection and Mitigation Measures).

Reclamation would be responsible for oversight of the construction contractor's management of public trail impact mitigation, including approval of trail use restrictions and monitoring the placement and condition of posted closure and/or warning signs. Any damaged signs would be replaced upon discovery. With the exception of the loss of the Auburn-to-Cool Trail river crossing in the project area, the Proposed Project construction impacts upon public recreation trails would be considered less than significant due to the incorporation of environmental protection and mitigation measures.

Impact 3.8-4 Impacts to public safety.

Public access to the site would be restricted and directed away from active construction areas, thereby reducing potential safety hazards for recreation or other public activities in the project area. This would be considered a less than significant impact.

Closure of the bypass tunnel results in the removal of a significant public safety hazard. This is considered a beneficial aspect of the Proposed Project.

Final design of the pump station facilities and the river restoration components would consider the anticipated increased public use of the project area. The PCWA project components would not be considered appropriate for access by the general public. As appropriate, the water supply facilities would be fenced and gates locked to prevent unauthorized access.

The diversion structure would be integrated into the river channel restoration and would be designed to provide a recreation benefit. River boating and swimming activities have associated hazards that cannot be totally eliminated, but are not directly or indirectly due to the project itself. As part of the channel design, areas would be developed to allow easy entry and exit of the river.

CDPR would manage the project area recreation activities and provide emergency assistance as needed. Additionally, rangers, park aids and volunteers would patrol the area to control and stop inappropriate use of the area that may pose safety or other hazards.

Overall, the impacts upon safety and recreation at the site would be considered an improvement over existing conditions.

Impact 3.8-5: Diversion upstream backwater effect on North Fork American River.

The diversion structure would result in a backwater effect upstream from the project site that would potentially inundate the Tamaroo Bar rapids. Preliminary design information indicates that this effect would be minimized through project design, to the extent feasible. Because the Proposed Project provides an overall improvement for boating, including a navigable artificial rapid as part of the diversion design, the anticipated increased frequency of inundation at Tamaroo Bar, relative to the existing condition, is considered less than significant.

Impact 3.8-6: Increased recreation use at the Middle Fork/North Fork confluence associated with public river access at Auburn Dam and Oregon Bar.

The improved river access and river restoration features of the Proposed Project would result in related increased use of the Middle Fork/North Fork confluence area, primarily for boating-related activity. Because the access to the project area would be considered "limited" the potential increase in demand at the confluence would not be considered substantial. However, on peak summer days and weekends, the confluence area does not have sufficient parking to accommodate users. The increased demand for parking and access to the confluence area under the Proposed Project would therefore result in a potentially significant impact for recreation facility management and enjoyment. There are not feasible measures to reduce this impact as part of the Proposed Project. However, CDPR and Reclamation will be initiating long-term planning efforts to update the Auburn SRA Interim Resource Management Plan (IRMP) to address issues throughout the Auburn SRA. This future planning effort will be comprehensive and would undergo environmental review (preparation of environmental documentation) to provide the public an opportunity to evaluate the influences of increased recreation activity in the area upon the environment.

In the interim, the unmet demand for increased parking at the confluence remains a potentially significant and unavoidable impact.

Upstream Diversion Alternative

Impact 3.8-7: Impacts to public recreation trail access.

Project area trails are listed under Impact 3.8-3 and shown on Figure 3.8-2. As with the Proposed Project, active construction areas would be closed to public access during construction of the Upstream Diversion Alternative. These measures are considered necessary and appropriate to protect the public and facilitate pump station construction. The total area closed to public access would vary by construction phase and activity.

The Upstream Diversion Alternative impacts upon project area trails would be similar to the Proposed Project (Impact 3.8-3) with the following exceptions: (1) Auburn-to-Cool Trail would not be bifurcated as the North Fork American River would not be restored to the dewatered channel; and (2) no additional trails would be developed as the public river access features would not be constructed.

Similar to the Proposed Project, special events or activities utilizing these trails would not be expected to be adversely affected by construction of the Upstream Diversion Alternative. CDPR would work with special event coordinators and Reclamation's construction contractor to avoid trail access impacts to annual events including the Western States Endurance Run, Tevis Cup Western States Trail Ride and the American River 50 Mile Endurance Run. The impact of the Upstream Diversion Alternative upon these annual trail events would be considered less than significant.

The public outreach program included in the Mitigation Plan, and trail management practices related to blasting activities would generally be the same as discussed for the Proposed Project.

Overall, the potential Upstream Diversion Alternative construction and project operation impacts upon public recreation trails would be considered less than significant due to the incorporation of environmental protection and mitigation measures.

Impact 3.8-8: Impacts to public safety.

Public access to the site would be restricted during construction, thereby reducing potential safety concerns due to recreation or other public activities in the project area, making construction-related impacts less than significant. The design of the pump station and related facilities would include fencing and other features to eliminate risk of injury to the public.

Hazards associated with unauthorized use of the river in the project area and presence of the bypass tunnel would remain significant safety issues. Environmental protection measures proposed as part of the Upstream Diversion Alternative include providing public information regarding the potential hazards and recreational use restrictions prior to reopening the area; posting of additional safety information/warning signs; placement of a buoyed cable line upstream of the tunnel inlet to discourage boat travel toward or through the tunnel; and creation of a flat-water pool area to enable exiting the river prior to the tunnel to reduce the hazards to recreationists, but would not eliminate them. This would be considered a potentially significant impact.

Impact 3.8-9: Diversion upstream backwater effect on North Fork American River.

As discussed under Impact 3.8-5, the year-round diversion would result in an upstream backwater effect. Because the Upstream Diversion Alternative does not involve rewatering of the river channel and creation of a new navigable rapid in the project area, the loss of rapids due to increased inundation of Tamaroo Bar is a potentially significant impact of this alternative.

Diversion-Related Impacts

Under current operating procedures, Lake Natoma and Keswick and Lewiston reservoirs serve as regulating reservoirs for Folsom Reservoir, Shasta Reservoir and Trinity Reservoir, respectively. This function enables releases from the larger upstream dams to fluctuate as needed for electrical power generation or other purposes while releases from the regulating dams on the downstream rivers can be made to change less abruptly. As a result, the water levels of Lake Natoma and Keswick and Lewiston reservoirs fluctuate regularly, but within a much smaller range of water surface elevation than Folsom, Shasta, and Trinity reservoirs. This creates relatively stable shoreline and launch-ramp conditions for swimming, fishing, and boating.

Therefore, although under the Action Alternatives, the upstream dam release schedules would change, they would not alter the function of the three regulating reservoirs. Even though water release patterns would be different from the existing condition, the Folsom and Nimbus dams, the Shasta and Keswick dams, and the Trinity and Lewiston dams would still be operated in a

coordinated way. Consequently, the historical range of water level fluctuations on Lake Natoma and Keswick and Lewiston reservoirs would be expected to continue into the future without substantial change.

Whiskeytown Reservoir acts in some respects like a large regulating reservoir between the Trinity and Sacramento river basins. It is subject to small daily fluctuations due to power and water temperature operations, but would be unaffected by the diversions of the Proposed Project or alternatives.

The diversion-related analysis refers to certain tables and graphs prepared to provide additional representation of the modeling results and comparison of simulated conditions. These tables and figures are included in Appendix H to the Draft EIS/EIR and are labeled by the appendix letter, resource section number, and ordered as it is referenced in the impact analysis (H-3.8-1, H-3.8-2, etc.).

No Action/No Project Alternative

The increased pump station diversion under the No Action/No Project Alternative would be less than evaluated for the Action Alternatives (see below). Based on the evaluation of modeling performed for the Action Alternatives, it is expected that the No Action/No Project Alternative would not result in significant impacts upon recreation activities associated with water bodies of the American River, Sacramento River or Delta, within the regional and project study areas.

Proposed Project and Upstream Diversion Alternative (Action Alternatives) Compared to the Existing Condition

The Proposed Project and the Upstream Diversion Alternative would result in the same timing and quantity of increased diversions from the American River. Changes in CVP or SWP operations associated with the Action Alternatives also would be the same. Therefore, the diversion-related analysis presented below represents the potential impacts that could occur with the Action Alternatives.

Impact 3.8-10: Impacts to water recreation activities on the Middle Fork American River.

Operation of the Action Alternatives would require some reoperation of the MFP as diversion amounts are increased. This reoperation would alter flow through the Middle Fork American River. Flow modifications during the summer and early fall months could affect the ability of whitewater boaters to travel down the river, thereby reducing Middle Fork American River whitewater boating opportunities. In addition, commercial whitewater companies could be economically affected by reservoir re-regulation if flow modifications reduced their ability to provide whitewater services to consumers.

Flows in the Middle Fork American River often occur as a result of regulated releases from Ralston Afterbay. The Ralston Afterbay, located approximately 20 miles east of the City of Auburn, is one of five MFP diversion dams and is operated as a re-regulating reservoir for the MFP.

Under the Action Alternatives, PCWA would continue to release higher flow rates from Ralston Afterbay on summer weekend mornings according to its informal agreement with Middle Fork commercial whitewater boating companies. However, to meet the higher base flows necessary for the project diversion and minimum flow requirements, the duration of higher flows suitable for rafting could be reduced.

To evaluate the impacts to whitewater boating on the Middle Fork American River, a hydrologic study of the Middle Fork American River was performed. This study, the Upstream Hydrologic Analysis (SWRI 1998), evaluates changes in operations of the MFP and associated changes in flows of the upper American River that would be necessary for proposed diversion patterns in the project area.

Table 3.8-2 shows the results of this hydrologic analysis as they pertain to whitewater boating on the Middle Fork American River. Analysis results indicate that the duration of daily releases for recreation may be reduced by up to eight hours each month of the June through October recreation season. This represents a potentially significant and unavoidable impact on whitewater boating and commercial whitewater companies along the Middle Fork American River.

Table 3.8-2					
Total Monthly Hours When Middle Fork American River Flows Would be Greater than 850 cfs					
	June	July	August	September	October
Existing Condition	440	469	458	200	166
Action Alternatives	439	461	454	197	166
Unit Change (Hours)	-1	-8	-4	-3	0
Percent Change	0	-2	-1	-2	0

The Proposed Project would provide public boating opportunities within the North Fork American River Canyon below the confluence to Oregon Bar/Folsom Reservoir. Restoration of this opportunity through the project area would provide a different type of boating experience and would not be considered a replacement for the loss of more challenging whitewater boating opportunities found on the Middle Fork American River. Boating miles for commercial rafting would not increase as a result of this project, but additional boatable river miles and greater public accessibility would be provided. Because this area presently is not officially open for public boating use, the additional boating access, primarily suited for novices, would be considered a beneficial aspect of the project. The Upstream Diversion Alternative would not provide this opportunity.

Impact 3.8-11: Impacts to lower American River recreation.

Water-dependent and water-enhanced recreation use on the lower American River is higher in May through September than in other months because of the warm, sunny weather. Therefore,

the focus of this evaluation was the effect of changes in CVP operations associated with the Action Alternatives during May through September.

When compared to the existing condition, the Action Alternatives would result in, at times, less frequent occurrences of lower American River flows within the optimal and maximum and minimum ranges for recreation. However, neither the frequency nor the magnitude of these changes is sufficient to adversely impact recreation. Therefore, this impact would be considered less than significant.

Table H-3.8-1 presents a summary of the number of years of the 70-year simulation in which the monthly mean flows below Nimbus Dam would remain within the optimal range for river recreation (3,000 to 6,000 cfs) and within the minimum to maximum range for adequate river recreation flow (1,750 to 6,000 cfs) under the existing condition and Action Alternatives. The table shows that over the course of the 70-year simulation, the Action Alternatives would result in monthly mean flows within the optimal flow range for recreation slightly less often than under existing conditions. In May, the number of years with flows in the optimal range would decrease by two years, in June it would increase by one year, in July it would decrease by three years, and in August and September it would decrease by one year when compared to the existing condition. For the entire May through September recreation season, there is a 3.6 percent decrease in the total number of months in which the flows would fall within the optimal range when compared to existing conditions.

According to the simulation results presented in Table H-3.8-1, the number of months the flows in the lower American River would be within the minimum to maximum range would be unchanged in May, July, and September and would decrease by one month in June, and one month in August. This is a decrease from existing conditions of 0.8 percent for the May through September recreation season.

Based on the above assessment, the Action Alternatives would have a less-than-significant impact on water-dependent and water-enhanced recreation use on the lower American River.

Impact 3.8-12: Impacts to boating at Folsom Reservoir.

When compared to the existing condition, the Action Alternatives would result in slightly less years when the reservoir surface elevation would be above the minimum required for boaters' access to launching ramps and marinas. However, this effect is not sufficient to adversely impact boating at Folsom Reservoir. Therefore, this impact is considered less than significant.

The primary boating season at Folsom Reservoir encompasses the months March through September, with peak use occurring in May, June, July, and August. Therefore, the focus of this assessment is the effect of changes in CVP operations associated with the Action Alternatives during the boating season. Because boating opportunity is heavily influenced by boaters' access to the launching ramps and marina, the relationship of expected lake levels to the usability of these facilities is evaluated.

Table H-3.8-2 compares the reservoir elevation and usability of boat launching facilities under the existing and Action Alternative conditions. For the months of March through September, Folsom Reservoir levels would fall below the 420-foot elevation necessary to keep all boat ramps operable in 4 more months (out of 490) under the Action Alternatives condition than under the existing condition.

Table H-3.8-2 also shows that at least one low-water boat ramp would remain available on each side of Folsom Reservoir approximately the same (only one month less) under the Action Alternatives as under the existing condition.

As indicated in H-3.8-2, the Action Alternatives would not reduce the usability of the Folsom Reservoir Marina wet slips (which require a minimum 412-foot elevation) in the primary boating season when compared to the existing condition.

Overall, the decrease in boating opportunities under the Action Alternatives would be negligible when compared to the existing condition. Consequently, the overall effect of the project on Folsom Reservoir boating opportunities would be less than significant.

Impact 3.8-13: Impacts to swimming at Folsom Reservoir.

The most popular swimming months at Folsom Reservoir are May through September, when the weather is typically sunny and hot. Designated swimming beaches at Beal's Point and Granite Bay are generally usable between the elevations of 420 and 455 feet. Below 420 feet, the water declines below sandy areas and/or is too distant from parking and concessions; visitation decreases substantially when low-water conditions occur. Even with reservoir levels in the vicinity of 430 feet, the water is relatively far from parking and concessions and some special low-water facilities are necessary to adequately accommodate swimmers. Above 455 feet, the high water limits the width of the available beach area, reducing the capacity of the beaches. As a result, to evaluate the effects on swimming opportunities of the Action Alternatives, the number of months when water levels are in the usable range during the peak swimming period were examined and compared to the existing condition.

As indicated in Table H-3.8-2, the Action Alternatives would reduce the availability of swimming beaches during the months of May through September compared to the existing condition. Overall, the number of years with water levels within the usable beach range during the months of May through September decrease by two out of 350 months. The number of years with water levels within the optimum range (435 to 455 feet) would be slightly reduced. There would be two fewer months (out of 350 summer months) when water levels are within the optimum range.

Over the recreation season, the effect of the Action Alternatives would be negligible when compared to the existing condition. Therefore, the overall impact on Folsom Reservoir swimming opportunities would be less than significant.

Impact 3.8-14: Impacts to recreation at Shasta Reservoir.

When compared to the existing condition, the Action Alternatives would result in no changes in the frequency of Shasta Reservoir surface elevation within the ranges required for boating and other water-related recreation activities at Shasta Reservoir. Therefore, there would be no impact to recreation at Shasta Reservoir.

The primary season for water-dependent and water-enhanced recreation activities at Shasta Reservoir is May through September. Therefore, the potential to affect reservoir levels during these months was assessed to evaluate impacts on boating-related activities, shoreline recreation, and boat-in camping. Because boating opportunity is heavily influenced by access to launching ramps, the relationship of reservoir levels to the operability of ramps was evaluated. Also, the drawdown distance of water from the vegetated shoreline was considered as an important factor in sustaining shoreline recreation use and boat-in camping.

Table H-3.8-3 presents a summary of the relationship between certain water surface elevation thresholds and recreation facilities and uses, based on a comparison of the existing and Action Alternatives. The most important lower threshold for boating is elevation 941 feet, above which at least one public launching ramp is available on each of the three major arms of Shasta Reservoir. Also presented is the information for elevation 1,017 feet, above which all public ramps are operable. For boat-in camping and shoreline use, the key threshold is elevation 967 feet, below which substantial decreases in use typically occur, because of the influence of the distance between the water and the vegetated shoreline. Also presented is an assessment of elevation 1,007 feet, below which shoreline use typically begins to decrease because of low water levels.

The Action Alternatives would result in no change in the total number of years when all boat ramps are usable (elevation 1,017 feet) during any month of the season compared to the existing condition. The number of years when at least one public ramp is maintained on each of the reservoir arms (elevation 941 feet) also would not change under the Action Alternatives, compared to the existing condition.

With regard to Shasta Reservoir shoreline and camping facilities, repeat visitors have come to expect the level to decline as the summer progresses; therefore, they appear to exhibit some tolerance of low-water conditions. Using the 60-foot drawdown criterion where boat-in camping and shoreline use begin to decline (1,007 feet), the analysis indicates that the Action Alternatives would result in no reduction in the number of years in which Shasta Reservoir levels would be suitable. The Action Alternatives would result in a slight increase in the number of years that Shasta Reservoir levels would be at or above the 100-foot drawdown (967 feet) during May through September. Therefore, the impact on Shasta Reservoir recreation opportunities would be less than significant.

Impact 3.8-15: Impacts to recreation at Trinity Reservoir.

When compared to the existing condition, the Action Alternatives would result in no changes in the frequency of Trinity Reservoir surface elevations below the levels required for boating and

other water-related recreation activities at Trinity Reservoir. Therefore, there would be no impact to recreation at Trinity Reservoir.

Similar to Shasta Reservoir, the primary recreation use season for water-dependent and water-enhanced recreation activities at Trinity Reservoir is from May through September. Therefore, the potential to affect reservoir levels during these months of the year was assessed for boating-related activities and shoreline recreation. Because boating opportunity is heavily influenced by access to launching ramps, the relationship of Trinity Reservoir levels to operability of ramps was considered. Also, the drawdown distance of water from the vegetated shoreline was evaluated as an important factor in sustaining shoreline recreation use.

As presented in Table H-3.8-4, the Action Alternatives would result in no change in the frequency of reservoir levels required to allow for boat launching from the three major public ramps during May through September. Therefore, there would be no impact on recreation at Trinity Reservoir.

Impact 3.8-16: Impacts to recreation on the upper Sacramento River.

When compared to the existing condition, the Action Alternatives would result in a greater frequency of upper Sacramento River flows above the minimum flow required for recreation. Therefore, there would not be an adverse impact associated with recreation on the upper Sacramento River.

Water-dependent recreation use on the upper Sacramento River, between Keswick Dam and the confluence of the American River, is higher in May through September than in other months of the year, coincident with the warmer summer weather. Consequently, effects of the Action Alternatives on Sacramento River flows during this period is important for evaluating recreation opportunity impacts.

A minimum recreation flow of 5,000 cfs is identified for the Sacramento River in the California Water Plan Update (DWR 1994). This is an overall standard that is not related to specific reaches of the upper Sacramento River, so it provides only general guidance in assessing recreation impacts. Definitive optimum and maximum/minimum river flows for recreation uses are not available for the upper Sacramento River, so the relative change in river flows are compared between the Action Alternatives and the existing condition to assess potential recreation impacts. If relative flows are not substantially less for the Action Alternatives compared to the existing condition, boat ramps and access points along the river between Keswick Dam and Colusa would not be adversely affected.

Figures H-3.8-1 and H-3.8-2 show probability of exceedance plots for the Sacramento River flow below Keswick Dam for May through September. These graphs demonstrate that the probability of the flow below Keswick exceeding 5,000 cfs is identical in all months. Therefore, flow conditions under the Action Alternatives result in a less-than-significant impact upon recreation opportunities in the upper Sacramento River.

Impact 3.8-17: Impacts to recreation on the lower Sacramento River.

When compared to the existing condition, the Action Alternatives would result in identical or improved flow conditions for recreation in the lower Sacramento River. Therefore, there would not be an adverse impact associated with recreation in the lower Sacramento River.

Similar to other water recreation areas of northern California, the highest recreation use period for the lower Sacramento River (between the American River confluence and the Delta) is from May to September. Under the existing condition, monthly mean flow in the Sacramento River at Freeport averages from 13,300 to 19,300 cfs during this period. As with the upper Sacramento River, although 5,000 cfs has been identified as an overall flow standard, no definitive thresholds for optimal or minimum/maximum recreation flows are available. Therefore, the relative difference between the existing condition and the Action Alternatives was evaluated.

Figures H-3.8-3 and H-3.8-4 show probability of exceedance plots for the Sacramento River flow at Freeport for May through September. These graphs demonstrate that the probability of the flow at Freeport exceeding 10,000 cfs is identical in all months. The entire flow range is virtually identical throughout the May to September period, except for August, where the Action Alternatives provides a clear benefit over the existing condition when flows are below 10,000 cfs. Therefore, there would be no impacts on recreation opportunities on the lower Sacramento River associated with the Action Alternatives.

Impact 3.8-18: Impacts to recreation at the Delta.

The Delta's hydrology is complex and influenced by other water sources, specifically tidal action, San Joaquin River inflows, and east-side tributary inflows. Consequently, differences in Delta inflow from the Sacramento River would not translate directly into Delta water recreation effects. For instance, incoming tidal action in the summer contributes approximately 70,000 cfs in the Sacramento River near Rio Vista and 58,000 cfs in the central Delta reach of the San Joaquin River (DWR 1994).

Table H-3.8-5 shows the impact of the project on Delta inflows to be about 0.1 percent. Consequently, the differences in summertime inflow to the Delta resulting from the project alternative condition would be a less-than-significant impact on Delta recreation opportunities.

When compared to the existing condition, the project alternative condition would result in no significant impact on flows entering the Delta. Therefore, this impact is considered less than significant.

Impact 3.8-19: Impacts to Oroville Reservoir or Feather River recreation.

The Action Alternatives would not result in substantial changes in storage or elevation at Oroville Reservoir, or in flow in the Feather River, relative to the existing condition. Any small changes that might occur would be considered less-than-significant impacts upon recreation resources.

Impact 3.8-20: Consistency with the American River Parkway Plan.

American River Parkway Plan Policy 3.1 on water flow anticipates that flow requirements are being researched and should be defined in the plan once the research is completed. The policy indicates that flow standards associated with the SWRCB's D-1400 (1,500 cfs for recreation) would be too low if they went into effect. This analysis indicates that the minimum flow for adequate recreation opportunity on the lower American River, based on a review of known flow criteria, would be 1,750 cfs. The low end of an optimum flow range appears to be about 3,000 cfs. Both the minimum and optimum flow criteria used in the EIS/EIR are higher than the D-1400 standard, and CVP operations associated with the Action Alternatives would not result in summertime flows being reduced below these criteria more often than under the existing condition. Therefore, the Action Alternatives would be consistent with the American River Parkway Plan, and no conflicts with environmental plans or goals of the plan would occur.

Impact 3.8-21: Consistency with state and federal Wild and Scenic River Act designations.

CVP operations associated with the Action Alternatives would not result in summertime flows being reduced below optimal and minimum flow criteria for recreation on the lower American River more often than under the existing condition. Therefore, CVP operations associated with the Action Alternatives would not diminish the recreational values of the lower American River, consistent with the state and federal recreational river designations.

Proposed Project and Upstream Diversion Alternative (Action Alternatives) Compared to the No Action/No Project Alternative in the Future (2025)*Impact 3.8-22: Impacts to water recreation activities on the Middle Fork American River.*

As discussed previously (see Impact 3.8-10), PCWA would continue to release higher flow rates from Ralston Afterbay on summer weekend mornings according to its informal agreement with Middle Fork American River commercial whitewater boating companies. To meet the higher base flows necessary for the project diversion and minimum flow requirements, the duration of the higher flows suitable for rafting could be reduced. However, based on a study of the Middle Fork American River (SWRI 1998), the reduction in the duration of higher flows is likely to be negligible.

Impact 3.8-23: Impacts to lower American River recreation.

When compared to No Action/No Project Alternative, the Action Alternatives would result in essentially the same mean monthly flows on the American River below Nimbus Dam (less than one percent difference) during the May to September recreation season.

Table H-3.8-6 presents a summary of the results pertaining to recreation on the lower American River. According to Table H-3.8-6, over the course of the 70-year period of record, implementation of the future cumulative condition would result in mean monthly flows within the maximum/minimum flow range for recreation (1,750 to 6,000 cfs) slightly less often than

under future no project conditions. June would experience an increase of one year within the maximum/minimum range, while August and September would each experience a decrease of one year. For the entire May through September recreation season, the decrease from No Action/No Project Alternative in the total number of months in which the flows would fall within the maximum/minimum range would be less than one percent.

The frequency of occurrence of Nimbus Dam releases within the optimal range (3,000 to 6,000 cfs) would increase or decrease depending on the month. The number of years within the optimal range would remain unchanged in May and September, would increase by one year in June, and decrease by one and two years in July and in August, respectively. The net long-term effect during the irrigation season would correspond to a decrease of less than one percent.

Based on the above assessment, when compared to the No Action/No Project Alternative, the Action Alternatives would have a less-than-significant impact on water-dependent and water-enhanced recreation use on the lower American River.

Impact 3.8-24: Impacts to boating at Folsom Reservoir.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in slightly less years when the reservoir surface elevation would be above the minimum required for boaters' access to launching ramps and marinas.

Table H-3.8-7 presents the number of years in which Folsom Reservoir surface water elevation falls within the desirable ranges for recreation. By comparison with the No Action/No Project Alternative, the net long-term effect of Action Alternatives is a positive one for boating at Folsom Reservoir. Consequently, there would be no adverse impact on Folsom Reservoir boating opportunities.

Impact 3.8-25: Impacts to swimming at Folsom Reservoir.

When compared to No Action/No Project Alternative, the Action Alternatives would result in negligible changes in the frequency of reservoir surface elevations within the range required for access to swimming beaches. As shown in Table H-3.8-7, there would be no net effect on the usability of swimming beaches during the months of May to September, and a net decrease of less than one percent in the number of months in which the reservoir levels would fall within the optimal range for swimming (435 to 455 feet). Therefore, the overall impact on Folsom Reservoir swimming opportunities would be less than significant.

Impact 3.8-26: Impacts to recreation at Shasta Reservoir.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in essentially the same long-term mean end-of-month surface water elevation during the May to September recreation season. In addition, over the recreation season, there would either be no net effect on the frequency of Shasta Reservoir surface elevation within the range required for boating and other water-related recreation activities at Shasta Reservoir, or a slight increase in frequency (Table H-3.8-8). Therefore, there would be a less-than-significant impact to recreation at Shasta Reservoir.

Impact 3.8-27: Impacts to recreation at Trinity Reservoir.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in no reductions in the frequency of Trinity Reservoir surface elevation above the level required for boating and other water-related recreation activities at Trinity Reservoir (Table H-3.8-9). Therefore, there would be no impact to recreation at Trinity Reservoir.

Impact 3.8-28: Impacts to recreation on the upper Sacramento River.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in essentially the same mean monthly flows below Keswick Dam during the May to September recreation season (Table H-3.8-10). Therefore, there would be no adverse impact associated with recreation in the upper Sacramento River.

Impact 3.8-29: Impacts to recreation on the lower Sacramento River.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in essentially the same mean monthly flows in the lower Sacramento River (Table H-3.8-11). Therefore, there would be no adverse impact associated with recreation in the lower Sacramento River.

Impact 3.8-30: Impacts to recreation at the Delta.

When compared to the No Action/No Project Alternative, the Action Alternatives would result in no impact on flows entering the Delta. Therefore, there would be no adverse impact associated with recreation at the Delta.

Impact 3.8-31: Impacts to Oroville Reservoir and Feather River recreation.

The Action Alternatives would not result in substantial changes in storage or elevation at Oroville Reservoir, or in flow in the Feather River, relative to the No Action/No Project Alternative. Any small changes that might occur would be considered to represent less-than-significant impacts upon recreation resources.

Cumulative Impacts*Impact 3.8-32: Impacts to lower American River recreation.*

Based on the future cumulative condition compared to the existing condition, additional diversions and potential CVP operations would result in substantial decreases in lower American River monthly mean flows during the high recreation use season. Compared to the existing conditions, the long-term average flow during the period of May through September would be approximately seven percent lower under the future cumulative condition.

Figure H-3.8-5 shows the probability of exceedance plots for lower American River flows below Nimbus Dam during May through September. Significant flow reductions are shown for July,

August, and September. Table H.3-8-12 presents a summary of the number of years in which the monthly mean flows below Nimbus Dam would remain within the optimal (3,000 to 6,000 cfs) and maximum/minimum (1,750 to 6,000 cfs) ranges for river recreation under existing and cumulative conditions. Reductions in the number of years out of the 70 years modeled in which the flows in the lower American River would be within the optimal range would occur in all months of the recreation season except for June. May and August would each experience a decrease of two years, while for July and September there would be reductions of 12 and six years, respectively. For the entire May through September recreation season, the long-term decrease from existing conditions in the total number of months in which the flows would fall within the optimal range is slightly over five percent (19 out of 350).

The simulation results presented in Table H-3.8-12 show that the number of months the flows in the lower American River would be within the minimum to maximum range would be increased in June by three years. The remaining months of the recreation season would experience decreases of two years in May, four years in July, six years in August, and three years in September. This represents an overall decrease from existing conditions of approximately three percent (12 out of 350) for the May through September recreation season.

Based on the above assessment, changes in CVP operations associated with the future cumulative condition would have a significant impact on water-dependent and water-enhanced recreation use on the lower American River.

Action Alternatives' Incremental Contribution to the Cumulative Condition

The incremental contribution analysis indicates that the monthly mean flows in the lower American River during the peak recreation season would be slightly increased (approximately 1.5 percent change) under cumulative conditions (with project) relative to the future base condition (without project). CVP operations associated with implementation of the project would contribute to a small increase (five out of 350 months) in the number of times the monthly mean flows would be reduced below the minimum recreation flow threshold of 1,750 cfs below Nimbus Dam.

Table H-3.8-13 presents a summary of the number of years in which the monthly mean flows below Nimbus Dam would remain within the optimal (3,000 to 6,000 cfs) and maximum/minimum (1,750 to 6,000 cfs) ranges for river recreation under the future base and cumulative conditions. Reductions in the number of years in which the flows in the lower American River would be within the optimal range would occur in the last three months of the recreation season. July and September would each experience a decrease of two years out of the 70 years modeled, while in August there would be a reduction of one year. This represents an overall decrease from existing conditions of about one percent for the May through September recreation season.

The number of months the flows in the lower American River would be within the minimum to maximum range (1,750 to 6,000 cfs) would remain unchanged in May and September and be increased by one year out of 70 years in June. July and August would experience decreases of one and two years, respectively. For the entire May through September recreation season, the

long-term decrease from existing conditions in the total number of months in which the flows would fall within the minimum to maximum range would be less than 1 percent.

Based on the above assessment, changes in CVP operations associated with the future cumulative condition would have a less-than-significant impact on water-dependent and water-enhanced recreation use on the lower American River.

Impact 3.8-33: Impacts to boating at Folsom Reservoir

Table H-3.8-14 compares the surface water elevation at Folsom Reservoir and the usability of boat launching facilities under the existing and cumulative conditions. For the months of March through September, Folsom Reservoir levels would fall below the 420-foot elevation necessary to keep all boat ramps operable in 37 more months (out of 490) under the cumulative condition than under the existing condition. This corresponds to a 7.6 percent decrease in the usability of all boat ramps.

Table H-3.8-14 shows that between July and September there is no net change in the frequency at which at least one boat ramp is available at each side of Folsom Lake. During the early months of the recreation season, the cumulative condition would result in a decrease of two years in March and a one year decrease in April, May, and June. In August and September, the cumulative condition would result in increases of four and one year, respectively, in which at least one ramp on each side of the reservoir would be usable. Over the entire boating season, there would be no net change in the number of years in which the at least one boat ramp would be usable on each side of the reservoir.

As indicated in Table H-3.8-14, the cumulative condition would reduce the usability of the Folsom Lake Marina wet slips (which require a minimum 412-foot elevation) in all months of the primary boating season when compared to the existing condition. The cumulative condition would result in an overall 7.6 percent decrease in the frequency in which the wet slips would be usable during the recreation season.

Under the set of assumptions for the future cumulative condition, the impact analysis indicates that in comparison to existing conditions surface water elevation at Folsom Reservoir would be frequently reduced. This would be a significant future impact.

Action Alternatives' Incremental Contribution to the Cumulative Condition

The incremental contribution analysis indicates that impacts to usability of boating facilities would be slight. Table H-3.8-15 shows that the Action Alternatives would reduce the usability of boat ramps one year out of 70 relative to the future base and cumulative condition. This represents a less-than-significant contribution to the cumulative impact to recreation at Folsom Reservoir.

Impact 3.8-34: Impacts to swimming at Folsom Reservoir.

As presented in Table H-3.8-14, the cumulative condition would impact the availability of swimming beaches during the months of May through September. The frequency in which the water levels would be within the usable beach range during the months of May through September would be reduced by seven percent (26 out of 350). The number of years with water levels within the optimum range (435 to 455 feet) would be reduced by four percent (15 out of 350 summer months).

Comparisons of simulated results for future cumulative and existing conditions show that during the recreation season Folsom Reservoir surface water elevation would fall outside the useable and optimal ranges more often for the cumulative scenario. The overall impact on Folsom Reservoir swimming opportunities would be considered significant.

Action Alternatives' Incremental Contribution to the Cumulative Condition

The incremental contribution analysis indicates that the monthly mean water surface elevation at Folsom Reservoir would be essentially the same for the peak recreation months (May to September). The results also indicate that the Action Alternatives would result in a negligible number of additional occurrences of Folsom Reservoir water level elevations dropping below the 420-foot boat ramp threshold or the 412-foot marina wet-slip threshold when compared to the future base condition (Table H-3.8-15). The usability of swimming beaches also would be only very slightly decreased (less than one percent decrease) under future conditions with or without the project. Therefore, any contribution of CVP operations associated with the implementation of the project to future potentially significant Folsom Reservoir recreation impacts would be negligible.

Impact 3.8-35: Impacts to recreation at Shasta Reservoir.

Table H-3.8-16 presents the modeling results concerning recreation at Shasta Reservoir. In comparison to the existing condition, the future cumulative condition would result in a reduction in the total number of years when all boat ramps are usable (elevation 1,017 feet), in every month of the recreation season. Over the long-term, there would be 25 fewer months (out of 350) in which the surface water elevation at Shasta would be high enough to allow all boat ramps to be used. This would correspond to a seven percent decrease in the frequency in which all boat ramps would be usable.

The number of years when at least one public ramp is maintained on each of the reservoir arms (elevation 941 feet) would also decrease under the future cumulative condition. Over the long-term, there would be 12 fewer months (out of 350) in which the surface water elevation at Shasta Reservoir would be high enough to allow the use of at least one boat ramp on each side of the lake. This would represent a decrease of three percent when compared to the existing condition.

With regard to Shasta Reservoir shoreline and camping facilities, the analysis indicates that the cumulative condition would result in an increase in the number of years in which Shasta Reservoir levels would drop below 1,007 feet. Over the long-term, there would be 27 fewer

months (out of 350) in which the surface water elevation at Shasta Reservoir would be suitable to shoreline uses.

With regard to boat-in camping use, the future cumulative condition would result in an increase in the number of years in which Shasta Reservoir levels would be at or above the 100-foot drawdown (967 feet) during May through September. Over the long-term, there would be 17 fewer months (out of 350, corresponding to a five percent change) in which the surface water elevation at Shasta would be high enough to sustain boat-in camping uses.

Under the set of assumptions for future conditions, the analysis indicates that in comparison to existing conditions the long-term average surface water elevation at Shasta Reservoir would be reduced by less than one percent during the recreational use period of the year (May to September). Although the overall reduction in elevation would be small, the reductions below critical thresholds would diminish recreation opportunities at Shasta Reservoir. Therefore, this would be a potentially significant cumulative impact.

Action Alternatives' Incremental Contribution to the Cumulative Condition

The incremental contribution analysis indicates that CVP operations associated with implementation of the project would result in no additional occurrences of Shasta Reservoir water level elevations dropping below the 1,017-foot boat ramp threshold or the 967-foot boat-in camping use threshold when compared to the future base condition (Table H-3.8-17). Shoreline use availability would decrease in one year for the month of June, representing a less than one percent decrease over the long-term. Therefore, any contribution of CVP operations associated with the implementation of the project to future potentially significant Shasta Reservoir recreation impacts would be negligible.

Impact 3.8-36: Impacts to recreation at Trinity Reservoir.

As presented in Table H-3.8-18, the cumulative condition would result in a slight decrease in the frequency of reservoir levels sufficient to allow for boat launching from the Fairview and Main Arm boat ramps. Over the 70 years modeled, the decrease in the number of months would be six and nine months, respectively. The future cumulative condition would result in no changes in the frequency in which the Stuart Fork Arm boat ramp could be used during the May through September recreation season.

When compared to the existing condition, the future cumulative condition would result in infrequent changes in the frequency of Trinity Reservoir surface elevations below the levels required for boating and other water-related recreation activities at Trinity Reservoir. Therefore, the future cumulative impact to recreation at Trinity Reservoir would be less than significant.

Impact 3.8-37: Impacts to recreation on the upper Sacramento River.

Water-dependent recreation use on the upper Sacramento River between Keswick Dam and the confluence of the American River is generally higher in May through September than in other months of the year, coincident with the warmer summer weather. Consequently, effects of the

future cumulative condition on upper Sacramento River flows during this period are important for evaluating recreation opportunity impacts.

Although the long-term average flow at Freeport would be reduced in all months relative to the existing condition, the decreases would generally be small. The greatest percent decrease in long-term average flow would occur in June (6.1 percent), when the flows are above 7,000 cfs. Figures H-3.8-6 and H-3.8-7 show the exceedance probability plots for the Sacramento River flow below Keswick Dam for May through September. These graphs demonstrate that the probability of the flow below Keswick exceeding 5,000 cfs is identical in all months except for May and September, when there is a slight decrease in the probability. Further inspection of the modeling results demonstrates that under the future cumulative condition the flow below Keswick Dam would be above 5,000 cfs in two fewer years in May and one fewer year in September, when compared to existing conditions.

When compared to the existing condition, the future cumulative condition would result in a negligible decrease in the frequency of upper Sacramento River flows below the minimum flows required for recreation. Therefore, there would be no significant adverse impact associated with recreation in the upper Sacramento River.

Impact 3.8-38: Impacts to recreation on the lower Sacramento River.

Figures H-3.8-8 and H-3.8-9 show the probability of exceedance plots for the Sacramento River flow at Freeport for May through September. These graphs demonstrate that the probability of the flow at Freeport exceeding 5,000 cfs is identical under the cumulative and existing conditions in all months.

When compared to the existing condition the future cumulative condition would result in identical frequency of upper Sacramento River flows above the minimum flow required for recreation. Therefore, there would be no impacts associated with recreation in the lower Sacramento River.

Impact 3.8-39: Impacts to recreation at the Delta.

The tidally influenced flows of the Delta are substantially more than the 13,200 to 19,200 cfs range of average inflow to the Delta from the lower Sacramento River from May to September. As a result, in-flows from the Sacramento River would not translate directly into Delta water recreation effects and any effect the lower Sacramento River flows could have on water-dependent and water-enhanced recreation would be at least moderated and, potentially, overshadowed completely, depending on the location in the Delta. Table H-3.8-19 shows that the greater decrease in average Sacramento river inflow to the Delta during the May through September period would be approximately 850 cfs. This would be an insignificant impact on Delta recreation opportunities.